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**AN EMPIRICAL INVESTIGATION OF
UK MERGERS AND ACQUISITIONS 1980-90**

by

JOHN STUART ARCHBOLD

Submitted in fulfillment of the requirements for
the degree of Doctor of Philosophy

at

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Department of Economics

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Stuart Archbold

DECLARATION

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John Stuart Archbold
June 1998

ABSTRACT

An important part of this study is the attempt to reconcile the contradictory findings about mergers and acquisitions reported in the financial economics and the industrial economics literatures. This is done by using both share price and accounting data, an approach not used in previous work.

Financial economics characterises the market for corporate control as rival management teams competing for control over corporate assets. Takeovers represent a necessary external discipline, whereby inferior management is displaced by those with superior management skills. Using share price data, most empirical studies support this characterisation and mergers as efficiency-enhancing transactions. In contrast, studies in the industrial economics literature have used accounting data to show that acquiring firms do not exhibit superior pre-merger performance and that mergers generally result in a decline in profitability post-merger. Results from the first phase of the empirical work tends to support the latter view, with a certain degree of compatibility between results with accounting data and those with share price data. At this stage the disciplinary hypothesis is not supported.

Another important part of this study investigates the impact of business and merger cycles on merger outcomes at the level of the firm. This work is prompted by the failure of previous studies to take account of the empirical literature on the modelling of merger cycles.

The importance of calendar time is confirmed by the results obtained. The full 1980-90 sample incorporates different phases of the business and merger cycles and the results with both accounting and share price data for this period are similar but rather inconclusive. However, when the sample is divided to reflect different phases of the business and merger cycles a very different picture emerges. In the period 1980-85 when takeover activity was low and competitive pressures in product markets were intense, acquiring firms on average appeared to adopt strategies consistent with the disciplinary hypothesis and delivered wealth gains to shareholders. In contrast, during 1986-90, when merger activity was at record levels and the economy was in an expansionary phase, shareholders of acquiring firms suffer substantial wealth losses, consistent with managerialist strategies. The accounting results corroborate these share price findings: they show that relative to targets and industry norms acquirers in the first sub-sample exhibited superior performance, consistent with the disciplinary hypothesis, while those in the second sub-sample did not.

These empirical results also provide an opportunity in the last part of the thesis to examine current UK merger policy. The time dependent nature of private returns suggests that mergers can be both a symptom and a remedy for agency problems. To the extent that such problems have implications for competition and economic efficiency, the results suggest that major shifts in policy are not warranted. However, the results for 1986-90 do suggest that there is a need to redress the information asymmetry between management and shareholders by extending the information disclosure provisions of the *City Code*. In public policy terms, increasing the information available to the shareholders of acquiring firms could have the desirable property of reducing the number of mergers that destroy value and reduce economic efficiency.

CHAPTER 1

The Takeover Market: Data and Theory

1. INTRODUCTION

The issues surrounding corporate mergers and acquisitions continue to excite considerable controversy and disagreement within the economics profession, (see for example, Mueller, 1989; Chatterjee, 1992). Disagreement is particularly sharp between the predominant views in two fields - industrial economics on the one hand and financial economics on the other. Economists from the former tradition are generally sceptical about the efficiency effects of mergers, whilst those from the latter generally hold the view that mergers tend to be efficiency enhancing. According to Mueller (1989), this discord arises, paradoxically, because there is more detailed information about mergers than almost any other economic phenomenon in the corporate sector.

The objective of the current research project is to make a contribution to the extant empirical literature by re-examining some aspects of the controversy that exists between the two economic traditions. The project seeks to draw on the research methods employed by both industrial and financial economics. This will require the use of both accounting and share price data.

The research is based on a matched sample of 559 UK acquiring and acquired firms. The sample period, 1980-90, can be divided into roughly equal halves. The first, 1980-85 represents a period of relatively low mergers and acquisitions activity, whereas the second, 1986-90, was a very active period. This sample provides the opportunity to examine systematically whether the economic consequences of mergers and acquisitions depend on the date of acquisition and the level of aggregate M&A activity. To date, a small number of UK studies have reported results that vary over time, (Limmack, 1990; Higson and Elliott, 1993; Sudarsanam *et al.*, 1996), but

none have had this issue as a primary focus. Using the financial characteristics of acquirers and acquired firms, drawn from their accounting records, the study will also attempt to distinguish between those acquirers that generate wealth increases for their shareholders and those that suffer losses.

Finally, the issue of whether acquirers in related acquisitions achieve better wealth effects than those in unrelated, or diversifying acquisitions is also examined. According to modern portfolio theory, diversifying acquisitions should not be valued by the market, (Levy and Sarnat, 1970). In addition both disciplinary and synergistic gains should be easier to extract in related acquisitions. However, the UK evidence, and to a lesser extent that in the US, is ambiguous with regard to this issue, (Limmack and McGregor, 1995).

The remainder of this chapter will provide the theoretical, regulatory, and historical context for the review of the empirical literature and methodological issues that follow in chapters 2 and 3, and the empirical research reported thereafter, in chapters 4 through 7.

The first section of this chapter provides a brief outline of aggregate merger activity in the UK, focusing on the period 1980-90, which provides the data sample for the empirical work to follow.

The second section reviews the regulatory frameworks that operate in the UK and the US. The latter is included because much of the empirical work on mergers and acquisitions has originated in the US. This US body of research will be referred to throughout the thesis and so some acknowledgement of the most important differences between the two regulatory regimes is required.

The third section examines some of the theoretical approaches that have been adopted in the search for an explanation of aggregate merger activity. In the fourth section the two major theoretical characterisations of merger activity are examined. The first emanates from industrial economics and in particular managerial theories of the firm that emphasize growth as the dominant managerial maximand, (for example, Marris, 1964; Baumol, 1959). The second is summarised perhaps best by the characterisation of Jensen (1986), whereby the mergers and

acquisitions are sited in 'the market for corporate control', with corporate management teams competing for control of the assets of firms. This strand of theory is based on the contribution from Manne (1965), which stresses the role of the takeover market as a disciplinary mechanism for corporate managers, and also that from Fama (1980) who sees takeovers as a discipline of final resort.

An important feature of these theoretical contributions from financial economics is the assumption that stock markets are 'efficient' and conform to the requirements of the 'efficient markets hypothesis', (Fama, 1976). The efficient markets framework is examined in section 6, (and examined again in much more detail in Chapter 3). The final section presents a summary and conclusions.

2. AGGREGATE UK MERGER & ACQUISITION ACTIVITY

2.1 Summary Data on Mergers & Acquisitions

The data in Table 1.1 exhibits considerable fluctuation over the period of interest for the current study, 1980-90. In terms of numbers, value, and as a proportion of corporate UK investment, takeover activity can be divided into two sub-periods 1980-85 and 1986-90.¹ The fluctuations over the sample period are typical of any statistical series on merger and acquisitions, in the UK and the US, (see Sudarsanam, 1995; Hughes, 1993; who present summaries for the UK 1972-92 and 1969-90, respectively).

When measured in terms of numbers, the recent peaks for UK mergers and acquisitions occurred in 1965, 1972-3, and again in 1987-8. In value terms, the peaks occurred in 1968, 1972, and 1988, (Sudarsanam, 1995, Hughes, 1993). As well as fluctuations in the aggregate measures, there has also been considerable variation in the average size of transaction over time. For example, in 1986 expenditure reached some £15.37 billion, and was a year in which mega-deals

¹ Although there is a fall in the number and value of mergers and acquisitions in 1990, there are a number of features of activity in that year that warrant its inclusion as part of a high activity period, particularly given M&A activity as a proportion of total investment. It was also a busy year in terms of referrals to the Monopolies and Mergers Commission, (Fairburn, 1993).

were struck, significantly higher than £1 billion. In contrast, in the following year 1987 no transaction exceeded £1 billion, but the number of deals increased sharply to 1528, with total expenditure of £16.54 billion. This, measured in constant prices, exceeded the earlier peaks in 1968 and 1972 by some considerable margin, (Sudarsanam, 1995; DTI, 1988).

Table 1.1

Aggregate UK Mergers and Acquisitions Activity 1980-90. Numbers, Nominal Expenditure, Expenditure in 1990 Prices (using 1990 GDP deflator), as a Proportion of Gross Fixed Capital Formation.

Year	Aggregate Number	Nominal Value £m	1990 Prices Value £m	% of GFCF
1980	469	1475	2701	8.2
1981	452	1144	1903	15.3
1982	463	2206	3429	18.5
1983	447	2343	3448	18.0
1984	568	5474	7647	24.3
1985	474	7090	9392	23.8
1986	842	15370	19863	50.7
1987	1528	16539	20356	44.8
1988	1499	22839	26505	49.1
1989	1337	27250	29377	50.6
1990	779	8328	8328	42.8

Sources: Sudarsanam (1995) and Hughes (1993)

There is a degree of regularity and consistency between acquisitions activity and business cycles in the UK, (and also in the US), and researchers have typically characterised aggregate activity in terms of 'merger waves', (Golbe and White, 1988; Town, 1992; Crook, 1995).² It is clear that macroeconomic factors and context have an influence on the aggregate level of takeovers. For example, the macroeconomy, at least to some extent, determines corporate sector profitability, and in turn expectations about profits drive the levels reached by stock markets. Not surprisingly then, the strong positive correlation between stock market levels and merger activity is now a regular feature of empirical results, (Golbe and White, 1988; Town, 1992; Crook, 1995).

² For a contrary view and evidence see Shuggart and Tollinson (1984).

However, whether these macroeconomic factors are alone sufficient to explain either the level or the changes in overall acquisitions activity is an important issue that will be explored below in section 5.

Table 1.2

Qualifying UK Mergers and Acquisitions by Type of Integration considered by the Mergers Panel 1980-90. All Figures are Percentages of Total Numbers and Total Value. (Criteria for qualification 25 per cent of market share, or asset value over £15m up to 1984, over £30m thereafter.)

	Horizontal		Vertical		Diversifying	
	Nos	Value	Nos	Value	Nos	Value
1980	65	68	4	1	31	31
1981	62	71	6	2	32	27
1982	65	64	5	4	30	32
1983	71	73	4	1	25	26
1984	63	79	4	1	33	20
1985	58	42	4	4	38	54
1986	69	74	2	1	29	35
1987	67	80	3	1	30	19
1988	58	45	1	1	41	54
1989	60	44	2	3	37	53
1990	62	49	2	2	36	49

Source: Annual Reports of Director-General of Fair Trading

The distribution of merger activity by economic sector has also exhibited considerable variability. The manufacturing sector plays an important role in UK takeover activity, typically accounting for 40 to 50 per cent of total activity, (Hughes, 1993; DTI, 1988). The importance of other sectors has tended to fluctuate over time, with late 1960s activity tending to concentrate in the manufacturing, engineering and heavy industrial sectors. In contrast the period 1984-86, was significant for the importance of the food, drink and tobacco and the distribution sectors, and over that three year period, these two sectors accounted for 49%, 49% and 42% of recorded merger activity respectively, (DTI, 1988).

The series on the types of merger also exhibits considerable fluctuation over time, (Sudarsanam,

1995; Hughes, 1993; DTI, 1988). However, horizontal integrations have dominated, generally accounting for around 60 per cent of total activity. Nevertheless, the proportion of horizontal mergers has declined somewhat in favour of the conglomerate form, from time to time. The proportion of vertical integrations has been very low and stable and typically 5% or less of the total. The distribution by merger type for the 1980-90 period is set out in Table 1.2.

Table 1.3
Financing of UK Mergers and Acquisitions 1980-90.
Consideration paid in Cash, Exchange of Shares,
Issue of Fixed Interest Securities as a Percentages of
Total Expenditure

	Cash	Shares	Debt
1980	52	45	3
1981	67	30	3
1982	58	32	10
1983	44	54	2
1984	54	34	12
1985	40	52	7
1986	26	57	17
1987	35	60	5
1988	70	22	8
1989	82	13	5
1990	75	20	5

Source: DTI Business Monitor Series Q7 & CSO Business Bulletins

The means of consideration or payment for merger activity has also exhibited considerable fluctuation, with cash and an exchange of ordinary shares alternating as the dominant form, although payment via fixed interest securities has been important at various times during the last 25 years. In the UK it has been the practice to offer a cash alternative when making a takeover bid via an exchange of shares, and so a mixed form of payment is often observed. One further thing needs to be said about the series on cash consideration. Whilst a bid might be made in terms of a straight cash offer, the bidder might well have made a rights issue in order to raise the

necessary cash, and in such cases the acquisition has been financed by shares. The consideration data for 1980-90 are presented in Table 1.3.

2.2 Recent trends in merger activity

The 1980s, and particularly the second half of the decade saw a number of relatively new developments. These included takeovers of unprecedented size³ and a massive increase in various forms of divestment by major, and usually conglomerate, firms disposing of peripheral activities. Indeed towards the end of the decade much of this divestment activity was characteristic of "a return to core businesses" on the part of a significant number of major companies, both in the UK and particularly in the USA, (Wright, Chiplin and Thomson, 1993; Shleifer and Vishny, 1991). For example, management buy-outs (MBOs) grew from approximately 2% of total merger activity at the beginning of the period, to a corresponding figure of 18% in 1987, (Dixon, 1990).

This divestment activity was also linked to two other prominent developments in the 1980s, the rise of leveraged buy-outs (LBOs), and the "hostile" take-over bid. A hostile bid involves an approach by another firm, an individual, or group of individuals to take over a target firm, in the face of opposition to such an approach from the incumbent management. In the process of such a bid the bidder would often go over the heads of the incumbent management and make a tender offer directly to the shareholders of the target firm, with what might be described as corporate warfare ensuing in the struggle for control.⁴

In some cases the bidder in this situation will raise the cash to be offered to the target shareholders by means of high-yield debt, (often referred to as "junk" bonds and "mezzanine" finance). This debt would be secured on the assets of the target and be repaid by selling-off the various businesses of the target firm. Hence the motive behind such hostile take-overs lay in the

³ For example, these include four bids in excess of £1 billion. in the manufacturing sector during 1986: United Biscuits-Imperial-Hanson, £1.9 billion; GEC-Plessey, £1.2 billion; Argyll-Distillers-Guinness, £1.9 billion; Elders IXL-Allied £1.8 billion, (Hughes, 1993). The scale of transactions during the latter half of the 1980s can be gauged by the fact that the five largest acquisitions accounted for over one-third of the total M&A activity in 1988, (Franks and Mayer, 1993).

⁴ As Wright *et al.*, 1993 point out the hostile takeover does not necessarily have to succeed to prompt substantial restructuring, citing Hoylake's hostile bid for BAT as an example.

belief of the raider that the parts of the target were worth more as separate entities than as a corporate whole.

2.3 Cross Border Merger Activity

Although there was a massive threefold increase in M&A activity in the countries of the European Union during the period 1983-87, the majority were contained within national frontiers, with the UK accounting for considerably more than any other country, (Geroski and Vlassopoulos, 1993). However, there was still a massive increase in cross-border M&A within the EU, which accelerated during the latter half of the 1980s. Some writers have argued that much of this M&A activity was prompted by the advent of the Single Market programme of the EU in 1992, (Jansson *et al.*, 1994). However, others have pointed out that even if this is so, it did not displace transatlantic M&As as the most important site for cross-border acquisitions. This was particularly so for UK companies who have accounted for the majority of European cross-border activity: for example, UK made 42.3 per cent of US purchase by foreigners in 1985, and by 1988 this had risen to 56.6 per cent, (Geroski and Vlassopoulos, 1993).

UK firms have a long record as acquirers of firms in other countries, particularly in the USA, as Table 1.4 demonstrates. Similarly, the UK has received substantial inward investment by foreign firms acquiring UK firms. With the advent of the Single Market, this cross border merger activity accelerated in the late 1980s.

Nevertheless, there can be little doubt that many UK companies, firms from other EU member states, together with firms from the US, Canada, and Japan, have all sought strategic advantage via mergers and acquisitions in readiness for the unified market. Some of these mergers have been aggressive attempts to secure positions in the enlarged market, others have been friendly alliances with the same intent, and yet others have been defensive reactions to the merger activities of rivals. Thus, in the 1980s and early 1990s the UK and mainland Europe was the scene of unprecedented merger activity, as the result of such strategic moves. This corporate re-structuring in the EU has been vividly described by one of the major participants in the following way:

Despite all the singing and cheering, Europe's companies are marching off to war. A war that will have its dead and wounded ... from which not everyone will come back a winner.⁵

Even allowing for the rhetorical overtones of statements such as this, it is clear that the planned introduction of the single market increased levels of cross-border European M&A activity in the second half of the 1980s. There is also survey evidence to suggest that it also had spill-over effects on domestic M&A, to the extent that these were part of a European market strategy, (Bruce, 1988; Jansson *et al.*, 1994).

3. THE REGULATORY ENVIRONMENT

Regulation and the way in which it is implemented can obviously have a significant impact on both the scale, form, and process of merger activity. Rather than provide a detailed examination of merger regulation as such,⁶ this section sets out to provide an outline of the *implications* of merger policy and regulation in both the UK and US for the current study.

3.1 Implementation of UK Regulation and Policy

In the UK the regulatory environment has been fairly stable, with only two substantial changes in legislation since the first provision in 1948. Following the Monopolies and Mergers Act, 1965, the legal provisions governing merger activity have only changed once since the Fair Trading Act 1973.⁷ In addition to the legal rules, mergers are also governed by the *City Code on Take-overs*. This is a voluntary, but in effect quasi-legal set of rules which seeks to control the trading and offers in shares. Its major aim is to ensure fair treatment of all the shareholders involved in a merger. As such it seeks to regulate the conduct of merger negotiations, rather than

⁵ Carlo De Benedetti, Chairman Olivetti, quoted in *Europe 1992*, Labour Research Department, London, 1991. Ironically, De Benedetti and his company Olivetti have turned out to be an early casualty of the corporate warfare that he envisaged.

⁶ For a detailed examination of the evolution of UK merger policy and regulation see Fairburn (1993) and also the various contributions in Fairburn and Kay (1989).

⁷ The Competition Act 1980 had no substantive impact on UK merger regulation. Since September 1990 a new set of legal requirements have been enacted under the aegis of the EU Merger Regulation. However, as the regulation has had no impact on the sample used here, its provisions are not discussed.

to control merger activity as such.

In contrast to the stable legislative provision, the implementation of UK policy has been subject to considerable changes in emphasis and inconsistencies, (George, 1989; Hughes, 1989; King, 1989; Fairburn, 1993). In addition to criticism from academics and professionals in the field, the corporate sector and their representatives have lodged many complaints about the inconsistency of policy implementation.⁸

In theory, UK policy towards mergers is neutral, but in practice it is often thought to be rather permissive, particularly with respect to horizontal mergers. One of the main reasons for this has to do with the 'burden of proof', which rests with the Monopolies and Mergers Commission - the statutory agency charged with the role of investigating merger proposals which are deemed potentially to be in breach of the legal rules. Following a referral from the Secretary of State for Industry, the Commission must judge whether a proposed merger would be against the *public interest*. This is a particularly difficult task given the broad and ill-defined nature of the public interest. For example, section 84(i) of the Fair Trading Act, 1973 does not define precisely what is meant by the term *public interest*, but instead indicate issues that might be considered. These include: maintaining and promoting effective competition; promoting the interests of consumers and producers in respect of prices, quality and variety; maintaining and promoting a balanced distribution of industry and employment;⁹ promoting though competition cost reductions, the entry of new firms and the development of new techniques. Not surprisingly, given the wide-ranging nature of the issues that the Commission is meant to take into account, the investigations that it has undertaken and the decisions reached have tended to be *ad hoc*. As a result it is difficult to discern a consistent and theoretically coherent set of 'rules' or 'measures' that have been applied.

⁸ At times UK policy has been more than simply inconsistent, it has also been contradictory. Following the introduction of the Monopolies and Mergers Act, 1965, the then Labour administration set up the Industrial Reorganisation Corporation in 1966 whose role it was to encourage and financially support (mostly horizontal) UK mergers.

⁹ As Fairburn (1993) points out, this is akin to the operation of some form of regional policy, which might be considered singularly inappropriate for a regulation dealing with the takeover market.

In addition to the lack of a definitive statement of the public interest, there are also a number of matters that serve, from time to time, to inhibit the investigatory work of the Commission. These include the asymmetry of information that exists between the firms under investigation and the Commission, the limited resources available to it, and also the limited time available.

Another inconsistent aspect of the operation of UK merger policy concerns the way in which references are made to the Commission. Referrals¹⁰ are at the discretion of the Secretary of State and, therefore, subject to political preferences. In an effort to clarify referrals policy, in 1984 the then Secretary of State, Norman Tebbit, produced what became known as the Tebbit guidelines. These were stated succinctly in the following way: " ... my policy has been and will continue to be to make references primarily on competition grounds". These guidelines have remained in place since then, and so, given that they confirmed a pre-existing policy stance, can be taken to have operated for the period covered by the current study. Thus the empirical work to be undertaken later does not need to consider major shifts in policy.

However, this is not to say that the Tebbit guidelines made the operation of UK merger policy any more consistent. For example, in his Annual Report of 1986, the Director-General of Fair Trading, charged under the 1973 Act with advising the Secretary of State, reported that "... [the Secretary of State] is prepared to see 'some detriment to competition' in the interests of employment and efficiency benefit." Summarising the effect of the Tebbit guidelines, Fairburn (1993: 251) comments that "... merger policy had limited impact on the merger boom of 1985 onwards". This is evidenced by the continuing low rate of referral to the Commission, which has remained at around 3 per cent of qualifying mergers since the 1973 Act. Furthermore, whilst the Tebbit guidelines seemed to presage a more clear-sighted focus on horizontal merger, these continued to dominate the UK takeover market as can be seen from Table 1.2.

Another aspect of the Tebbit guidelines and the operation of merger regulation in the 1980s was the shift from concern with purely domestic concentration and market shares, to an explicit

¹⁰ The criteria for reference are twofold: an assets test which began at £5m. and has been subsequently increased on 3 occasions, (£15m. in 1980; £30m. in 1984; £70m. in 1994); and a market share test of 25 per cent. A merger can qualify under either criterion.

inclusion of overseas competition. This served, in practice, to make the implementation of UK merger policy even more permissive. A corollary was an explicit reliance on the market for corporate control and its role in shifting assets to their highest valued uses. A quotation from the policy statement contained in the 1988 White Paper serves to make this point, (DTI, 1988: para. 2.11):

"A particular advantage of avoiding government intervention as much as possible in the market for productive assets is that the threat of takeover has a salutary effect on the incumbent managements of public companies. They should be under the discipline of having to demonstrate to their shareholders that they are running the company as efficiently as possible. Any government action which places obstacles in the way of takeovers weakens this discipline. There needs to be a strong case for government intervention to prevent a takeover if this advantage of non-intervention is to be set aside."

As a result of this policy stance, the UK during the 1980s provides possibly the best site for an examination of the relatively unfettered operation of the takeover threat and the resultant gains (losses) of the market for corporate control, (Franks and Mayer, 1996).

3.2 Implementation of US Regulation and Policy

Although the current study is situated in the UK, as mentioned earlier considerable use will be made in what follows to the US empirical literature on mergers and acquisitions. Although UK studies have made a substantial contribution to the extant literature, those from the US have made some of the most important contributions.

The legislative basis for merger controls has a longer history in the US than in the UK. The US regulation began with the Sherman Act, 1890: this was followed by the Clayton Act 1914 (subsequently amended in 1950 to close a perceived loop-hole). A third major law, the Hart-Scott-Rodino Act was passed in 1976¹¹.

As well as having a longer lineage, the US legislation has also been applied typically with much more rigour than in the UK. For example, in the recent past there has been what amounts to a

¹¹ Unlike the UK, it is possible for interested parties to file suit to prevent a merger under the US legislative provisions, in addition to the statutory authorities, the Federal Trade Commission and the Department of Justice.

presumption that mergers are *per se* a bad thing in economic terms, with the burden of proof mentioned above operating in the reverse direction to that applied in the UK. Under legislative provisions horizontal mergers were practically outlawed, with the Department of Justice Merger Guidelines 1968 virtually ruling out economies of scale and efficiency defenses, an interpretation that was upheld by the courts, (Weston *et al.*, 1990). Since that time, however, the regulatory climate changed considerably, and with the advent of new Merger Guidelines in 1982 and 1984 policy towards mergers operated in a more relaxed and permissive way, allowing the takeover market to operate more freely.¹²

Nevertheless, significant differences between merger policies and their enforcement still exist between the US and the UK. For example, the more active policy stance in the US may have acted as a preventive screening device for merger proposals there, in a way that it would not have done in the UK. This is unlikely to bias the subsequent analysis to any great extent, but it is, nevertheless, worthwhile bearing this point in mind in what follows.

3.3 Shifting Regulatory Regimes and Economic Theory

The brief reviews of regulatory environments in the UK and US have shown that there have been important changes in policy stances in both countries. These changes are correlated with developments in economic theory that have also had an impact on the evolution of economic research into mergers and acquisitions. It is probably useful, therefore, to examine briefly the developments in economic theory which have accounted for these changes.

The important developments in economic theory, as they have to do with merger regulation, focus on the meaning and definition of the term *competition*. Until recently, conventional economic analysis has conceptualised competition in structural terms, with measures of industry or market concentration representing the major characterisation of competition, followed closely by measures of barriers to entry. The implication for public merger policy was, therefore, to view any merger which was likely to have an adverse impact on measures of either market concentration or barriers to entry, or both, as likely to affect social welfare adversely, and thus

¹² After closure of the Reagan Administration, the regulatory regime has tended to regress towards the earlier regimes, although it seems unlikely to revert to the very strict interpretations prior to 1980, (Weston *et al.*, 1990)

to present *prima facie* a case to oppose merger.

However, since the contributions of Demsetz (1973a, 1973b, and 1982), Baumol (1982), and Baumol *et al* (1982) the focus of attention has shifted. The concept of competition to which these theoretical contributions gave rise, was transformed from a static measure of concentration to a more dynamic concept which viewed competition as a process. This "neo-Austrian" conceptualisation perceived market power as a transient phenomenon which the vital forces of competition would eradicate in the long run. Whilst barriers to entry continued to receive much attention, barriers to exit were also seen as an important factor in the shaping of competitive forces. There was also a challenge to the orthodox interpretation of the positive relationship between concentration and/or firm size and profitability. Demsetz (1973a,b) argued persuasively against this orthodoxy, claiming that the data which showed large firms in highly concentrated industries making large profits was a sign of efficiency, not a sign of abuse of market power.

These developments in economic theory played an important and direct role in the loosening of anti-trust regulation in the United States during the Reagan Administration's period of office, (Weston *et al.*, 1990). They are also thought to have had an equally important, if less direct, part to play in the shaping of policy implementation in the UK. As a result there is little doubt that in both the UK and US firms now face a much more liberal and permissive regulatory environment. Nevertheless, as Franks and Mayer (1996: 165) suggest, "In fact, the U.K. has certain advantage over the U.S. in that there are fewer antitakeover provisions enshrined in either corporate charters or state legislation".

4. MERGER THEORY AND INDUSTRIAL ECONOMICS

While industrial economics has had much to say about the implications of merger activity for social welfare, the debate has been conducted almost exclusively within a public policy domain. There have been surprisingly few attempts at developing a "general" theory of mergers, or even a set of theories which deal with a particular class of mergers. This is in stark contrast to the field of financial economics, (see section 5 below), which has produced a burgeoning theoretical literature that attempts to meet both these objectives, (Caves, 1989). However, since the

contribution by Marris (1964), there have been some attempts by industrial economists to provide such theoretical insights. Two of the more influential theories are reviewed below.

4.1 Mergers and Managerial Theories of the Firm

Mergers and acquisitions have been a persistent, and at times pervasive phenomenon in developed capitalist economies since the end of the nineteenth century. However, the traditional neoclassical theory of the firm, with its set of highly restrictive assumptions, offered little insight into either the motivations for, or efficiency outcomes of mergers. It was not until the major assault on the traditional theory of the firm by Berle and Means (1932) that this became possible. In highlighting the corporate governance issues raised by the divorce between ownership and control of the modern corporation, they provided the means for a formal analysis of mergers. If managers were no longer constrained to act solely in the interests of shareholders, the possibility of activities which further managerial interests became possible. By engaging in merger activity, managers might be able to escape the discipline of competition in product markets and accrue benefits to themselves by engaging in non-profit maximising behaviour.

The insights of Berle and Means in time spawned a number of alternative, managerial theories of the firm such as that provided by Baumol (1959), Penrose (1959) and Marris (1963, 1964). Although each of these and other approaches to the theory of the firm introduced different emphases, a major thrust was common to all. Both shareholders and competitive market forces could apply only a weak form of discipline over managers and so the latter could engage in discretionary behaviour which would enhance their welfare, at the expense of the owners. Another factor common to these writers was that growth was a major objective of corporate managers, often ranking *pari passu* with the profits objective. This managerialist approach provided an obvious way to incorporate merger activity within the theory of the firm.

Of these alternative theoretical developments, perhaps the most fruitful was provided by Marris (1963). As well as explaining why managers might have an incentive to engage in mergers and acquisitions, more importantly Marris also incorporated the threat of take-over as a formal constraint on discretionary, non-profit maximising managerial behaviour. Managers who pursued their own welfare at the expense of shareholders could only do so up to a certain point. Beyond

that point, the firm's market value would fall to such an extent that it would be a signal to other management teams of the firm's vulnerability to a take-over bid.¹³

However, a major problem with managerialist theories of the firm has been the problem of providing a direct test of their predictions, (Francis, 1980). Some empirical testing has been attempted, (for example Nyman and Silbertson, 1978), but often these attempts have foundered due to the need to devise some (arbitrary) distinction between owner-controlled and manager-controlled firms. By and large these managerialist theories have fallen into disuse, although it is interesting to note the extent to which they anticipated the later and hugely influential principal-agent formulations, (Jensen and Meckling, 1976).

4.2 Gort's Disturbance Theory of Merger Activity

Although Gort (1969) is concerned mainly with an explanation of fluctuations in aggregate merger activity, his theory accounts for merger activity in terms of management expectations and objectives. First, management expectations of increases in market value that are expected to arise from economic benefits which flow from a merger, such as economies of scale and increased market power. Second, a discrepancy between the views of the bidder management and those of the target management over the 'true' valuation of the assets represented by the target firm. Despite the prospects that might arise from the objective conditions, Gort (1969: 624) advances the hypothesis that "... forces which generate discrepancies in valuation are decisive in determining variations in merger rates both among industries and over time." He argues that whilst motives for real economic gains are always available, these factors are not necessary to explain the fluctuations in merger rates.

Gort questions the managerial motives for mergers advanced by Marris (1964), arguing instead that the data show that acquired and acquiring firms are drawn from an asymmetrically distributed sample of the total population of firms. Thus, according to Gort, for managerial growth motives to be the major determinant of merger activity, Marris would have to demonstrate why "ambitious managers" should be located solely within that asymmetrical

¹³ This, of course, anticipated the seminal work on the market for corporate control by Manne (1965).

sample. In other words Gort is of the view that managerial motives alone are insufficient to explain fluctuations in merger activity between industries and over time. Rather valuation discrepancies determine such fluctuations, and these arise due to differences in expectations about the future income streams and risks associated with a particular collection of assets. Specifically, he sets out to explain, "... why there are systematic variations in such discrepancies." (Gort, 1969: 626).

Gort proceeds by pointing out that the current market price of shares is determined by trading at the margin, in other words he distinguishes between the secondary capital market and the market for corporate control. As such it is not possible to draw inferences about the 'true' valuation from the current market price. Whilst the market price serves as the 'true' valuation under normal trading conditions, the latter can be affected significantly under conditions of "economic disturbance".

Economic disturbances arise as the result of shocks to the financial system and in the real economy. In particular, two types of shock dominate. First changes in product and process technology, and, second, dramatic changes in share prices as a whole. Both of these cause an increase in uncertainty, make forecasting less reliable and lead to a greater variance in the valuations of agents and corporate management teams.

Valuation discrepancies of the type needed to change merger activity will tend to occur when stock markets are high, rather than low. This is because when share prices are low, managers and shareholders in target firms are likely to believe that the firm is undervalued, and so they are less likely to accept a bid close to the market price. In turn bidders would be reluctant to pay a premium significantly in excess of the market price, the price at which an individual investor could acquire a holding in the target. Therefore, a prediction of Gort's theory is that take-over activity will be higher when stock market prices are high - a prediction that seems to be borne out by a number of empirical studies, (Golbe and White, 1993; Town, 1992; Crook, 1995).

Pursuing the valuation discrepancy argument, Gort then suggests that other factors, such as barriers to entry and growing demand in product markets, in conjunction with valuation

discrepancies, will also affect merger activity. These factors, he postulates, provide an explanation for differences in merger rates between industries. When barriers are low, he posits that the difference between market value and the replacement cost of assets will be low. This situation limits the variance in valuations held by bidders and targets and thus limits the possibility of mergers due to valuation discrepancies. Conversely, when barriers are high, there is a greater difference between market values and replacement costs, which results in a larger variance in valuations, and thus generates increased merger activity.

Increases in demand will require increases in capacity which can be achieved either through internal growth or via mergers and acquisitions. The more firms that require capacity increases, the greater will be the chance that valuation discrepancies will be discovered. Furthermore, in periods of excess demand, product market prices will increase sharply and this will also cause an increase in valuation variance. Together these effects are likely to lead to increased merger activity.

Gort also discusses the influence of other industry-specific characteristics which are likely to influence merger rates; for example, where the containment of competition is a motive for merger. This is less likely to be successful in a growth industry because industry growth, being associated with increases in firm numbers would mean that monopoly advantage would be short-lived. Thus, *ceteris paribus* we might expect to observe an inverse relationship between industry growth and merger activity. Similarly, where economies of scale are important, we might expect an inverse relationship between industry growth and mergers, because achieving the requisite scale via internal growth is easier. So industry structure, characterised by concentration measures could also influence merger activity.

Gort distinguishes his disturbance theory from a "bargains theory" of mergers, by contrasting the predictions which emanate from both. In the case of the latter, the prediction would be that a poor profits performance would be reflected in a 'low' market price, which when coupled with the bidder's knowledge about how better returns could be generated from the same set of assets would lead to an opportunistic bid. In contrast, the disturbance theory predicts that bids occur when prices are high and when expectations are reflected in a high price-earnings ratio for the

target. Thus Gort emphasises that his theory is not a "bargains" theory of merger, which he argues is inconsistent with the data.

Whilst Gort's theory provides some interesting insights, its aim is to explain the level of overall merger activity, and particularly changes in that activity, rather than to say something about the efficiency effects of that activity. It is thus rather limited in what it can tell us about either private or social welfare effects, and the framing of public policy. Furthermore, a recent UK times series study, using modern co-integration techniques, failed to find support for Gort's theory, (Crook, 1995).

Others have also suggested theoretical approaches based on the idea of economic disturbance. For example, Aaronovitch and Sawyer (1975) have argued that disturbance in the form of increased competition leads to increased uncertainty. This in turn leads to attempts by some management teams to reduce uncertainty by achieving rapid growth in market share via merger. According to Aaronovitch and Sawyer increased competition might also lead to reduced profitability, and thereby induce increased merger activity with the aim of restoring profits via economies of scale. A similar argument has also been advanced by George and Silbertson (1975), who posit attempts to arrest the impact of increased competition on profits via acquisitions of rivals.

Another aspect that Aaronovitch and Sawyer (1975) have in common with Gort (1969) is that in their view economic disturbance alone is insufficient to increase merger activity. In addition a growth context is necessary, because in a declining market shareholders are likely to consider their shares are undervalued. In such conditions, according to Aaronovitch and Sawyer, collusion would be a more likely response.

Although these approaches have a certain intuitive appeal and some correspondence with notions of strategic management, like managerialist theories (Marris, 1964) it is difficult to conceive of a convincing empirical test. The one clear prediction that emanates from them, that merger activity will be higher in periods of economic growth, would not necessarily be inconsistent with any number of other theories. Perhaps for these reasons, they have not been pursued in the recent

literature.

4.3 Mueller's Theory of Conglomerate Merger

The analysis of Mueller (1969) bears some striking resemblances to the free cash flow theory of Jensen (1986), even though it anticipates the latter by some seventeen years, and was published in the industrial economics tradition. Unlike Gort (1969), Mueller attempts to make a contribution to the debate about the efficiency effects of merger activity.

Mueller (1969) begins by arguing that the conventional theory of the firm does not help in an analysis of conglomerate mergers. The usual synergy and managerial displacement hypotheses seem less plausible in the case of a merger between firms in unrelated areas of business, particularly, as is often the case, when the acquired firm is allowed to operate with some degree of autonomy. Indeed, recent developments in agency theory and the work of Porter (1987) suggest that even if the incumbent management team is not replaced, an improved performance can be elicited by simply changing their contract of employment in a way which harmonises their objectives with those of shareholders.

Again in contrast with Gort, Mueller advances managerial growth objectives as the major motive for mergers. The divorce between ownership and control is an important matter which gives rise to a direct conflict of interests between managers and shareholders. An implicit assumption is that the market for corporate control is an ineffective disciplinary mechanism, and so managers have, and utilise, considerable discretion over the assets they control. Mueller posits that this will be even more likely in the case of mature firms.

He postulates that in a profit maximising world, mergers could only take place if one of three alternative sets of conditions hold. First, that both sets of shareholders have the same expectations about future earnings, but the bidder firm shareholders have a lower discount rate than the target shareholders. Second, that both groups have the same discount rates, but synergistic benefits are expected. Or third, that no synergies are expected, but the expectations about the earnings stream differ between the two groups of shareholders. Mueller rejects the first and the third postulates, arguing that, in an efficient capital market, arbitrage would eliminate

such possibilities. Thus if a profit maximising framework is applied to conglomerate mergers, synergies would appear to be the only plausible motive. However, given the nature of conglomerate mergers, the potential for synergies is not obvious.

Nevertheless, Mueller suggests three possibilities for conglomerate synergy. The first is due to better management. This is clearly possible, but less likely than in the case of horizontal or even vertical integration, given that the acquiring management team might not possess the industry or market-specific skills and knowledge required to improve the performance of the acquired firm. The second possibility arises from financial synergies and a lower cost of capital. Whilst plausible at first sight, particularly if the acquirer is larger than the acquired firm, there are some theoretical difficulties here, as Mueller points out. In an efficient markets framework, or in the face of effective arbitrage, the acquirer cannot have a lower cost of capital in risk-adjusted terms. The availability of free cash flow to the bidder, but not the target might be offered as a counter-argument here. But if that were so, then the target firm would have to raise finance by offering a higher rate of return to the capital market, and so the bidder would be better off buying stocks or bonds on issue from the target, rather than paying the typically large premiums required to assume control.

The third possibility for synergy is a reduction in earnings risk which a conglomerate merger might offer. However, as Mueller makes clear, modern portfolio theory would suggest that the firm should not attempt to do for its shareholders that which they can do (more efficiently) for themselves, namely, diversify to reduce risk, (see Levy and Sarnat, 1970). Thus Mueller dismisses financial synergies as a potential gain from conglomerate merger.

Mueller then concludes that potential synergies, and differences in expectations between the two shareholder groups do not provide a sufficiently plausible explanation for the high incidence of conglomerate merger which is observed, particularly in the US.

Finally, Mueller examines differences in expectations held by the various management and shareholder groups. For example, if the two sets of managers hold different expectations about the future earnings stream, then a conglomerate merger can take place even when the discount

rate for the two groups of shareholders is identical. Furthermore, the likelihood of such mergers being consummated is even greater if managers of the bidding firm have a lower opportunity cost of capital than their own shareholders; a situation which can easily arise in the presence of large amounts of free cash flow.¹⁴ *A fortiori*, the likelihood of take-over is increased, despite resistance from target management, if there is a similar discrepancy in opportunity cost between the target management and its shareholders.

Thus, according to Mueller (1969), conglomerate mergers can only be driven by managers holding non-profit maximising objectives. If managerial self-interest is best served by a growth objective,

then all firms represent takeover opportunities. Assuming acquisition-minded managers are rational, they will prefer targets that present opportunities for synergies, that is non-conglomerate take-overs. However, given the US anti-trust regulation, which until the 1980s virtually ruled out horizontal and vertical integration, they will next seek conglomerate or diversifying opportunities. This would seem to represent a strong case against a profit maximising framework, because in the light of the same regulatory environment, the opportunities for synergistic mergers would decrease, and so, again given rationality on the part of managers, we should observe a decline in merger activity. This, Mueller claims, is the opposite of what is, in fact, observed.

5. MERGER THEORY AND FINANCIAL ECONOMICS

At the time that Marris (1963, 1964) and others from the 'managerialist school' were developing alternatives to the traditional theory of the firm, neo-classical theorists were also developing their own response to the inadequacies of conventional theory, and in particular to the challenge of Berle and Means (1933). Of particular importance was the contribution by Manne (1965).

5.1 The Theory of the Market for Corporate Control

¹⁴ Free cash flow is the corporate cash flow available to managers after all positive NPV projects have been undertaken. At this stage of the analysis, Mueller produces arguments very similar to those advanced much later by Jensen (1986).

Manne (1965) realised the danger that the Berle and Means attack represented to the neo-classical case for allocative efficiency via self-regulating, competitive markets. In response, he sought to show how capital market discipline would restore profit maximising behaviour and allocative efficiency of free markets. He accepted that product markets were not competitive in the strict neo-classical sense and that oligopoly was the dominant form in industrial and commercial markets. Under these circumstances, it was possible that profit maximisation was no longer a survival condition for individual firms, and so managers had the potential for discretionary behaviour.

Although a firm's shareholders had, *de jure*, the right to discipline wayward managers, *de facto* this was unlikely to happen given the wide dispersion of ownership claims and the asymmetry of information between the two groups. Monitoring and enforcement costs were likely to be prohibitive for any individual shareholder, as were the costs of forming an effective coalition: furthermore, free-riding was always a potentially appealing strategy for the individual shareholder.¹⁵ As a result, any challenge to managerial discretion was likely to be, at best, rather weak.

The managerialist school hypothesised that growth was likely to be a dominant management objective, and so, one obvious outlet for discretionary behaviour was growth via mergers and acquisitions. In contrast, rather than seeing M&A activity as a sign of self-interested management action, Manne viewed it as the mechanism by which harmful managerial discretion could be controlled. The market for corporate control posed an effective threat to under-performing management teams, with the capital market providing the signal for and measure of management under-performance via the decline in a firm's share price.

This analysis has continued to be one of the major strands in the theoretical arguments to be found in the financial economics literature to the present time. In an early example, Mandelker (1974) describes the market for corporate control as " ... the perfectly competitive acquisitions market". In a later contribution, Jensen (1986a: 7) summarises his view of the market in the

¹⁵ For a detailed examination of these and related issues, see Yarrow (1985).

following way:

"The market for corporate control is creating large benefits for shareholders and for the economy as a whole. The corporate control market generates these gains by loosening control over vast amounts of resources and enabling them to move more quickly to their highest-valued use. This is a healthy market in operation, both on the takeover side and the divestiture side."

An important pre-requisite for the effective operation of this disciplinary mechanism is, of course, that the capital market is efficient in setting share prices - an important issue which will be dealt with in some detail below. Manne (1965) simply assumed that the capital markets were efficient in this respect, a practice which has been adopted by the majority of writers in the financial economics tradition since.

The important contribution provided by Manne(1965) was the formulation of merger activity as a disciplinary mechanism which would enhance economic efficiency, turning on its head the managerialist view of mergers as a mechanism by which managers could derive benefit at the expense of shareholders and society as a whole. The emergence of the concept of a market for corporate control has had a profound effect on economic thinking and research programmes ever since. However, if the *threat* of takeover and loss of office is as real and as potent as suggested, then a number of questions arise.¹⁶ First, if the takeover threat is indeed real, then why is it necessary for it to be invoked as often as it is? Second, what explains the large fluctuations in this form of market discipline over time? (Mueller, 1992; Dickerson *et al.*, 1997).

5.2 The Managerial Labour Market

In their theoretical formulations, Marris and Manne both give a prominence to the market for corporate control and make it the pre-eminent disciplinary mechanism. An alternative approach has been suggested by Fama (1980). Building on the property rights literature, developed from the separation of ownership and control debate, and extending in particular the work of Alchian and Demsetz (1972) and Jensen and Meckling (1976), Fama sets out to show that the managerial

¹⁶ Manne (1965: 120) is clear that the disciplinary mechanism can only be shown to be activated when, "... actual changes in the management personnel ultimately follows the merger". However, As Porter (1987) demonstrates disciplinary action does not necessarily require the dismissal of managers of an acquired target.

labour market, acting on efficient signals from the capital market, is the primary disciplinary mechanism. The market for corporate control has an important role to play in controlling corporate management teams, but only in so far as it is the "discipline of last resort".

Fama argues that the role of the owner-manager or entrepreneur of the traditional neo-classical theory is an outmoded concept, which must be replaced by a fully worked-out schema of the separation of ownership and control. In fact he sets out to show that such a separation "can be explained as an efficient form of economic organisation within the 'set of contracts' framework", (Fama, 1980: 289). He expands on this by stating, Fama (1980: 290):

"In this 'nexus of contracts' perspective, ownership of the firm is an irrelevant concept. Dispelling the tenacious notion that a firm is owned by its security holders is important because it is a first step to understanding that control over a firm's decisions is not necessarily the province of security holders".

For Fama, capital is but one factor of production in the set of factors which constitutes the firm. He makes the point that each factor is "owned" by somebody and so ownership in this sense is not a concept unique to shareholders. The major difference between security holders and other factor owners is that the former are risk bearers of last resort, who guarantee their performance by putting money up front. He separates management and risk-bearing functions, arguing that there are separate markets for each. Therefore, market disciplines over managers and shareholders are to be found only in the appropriate markets. In the case of managers, the primary disciplinary mechanism will be the market for managerial labour, which operates both within and without the firm. Fama demonstrates that under assumptions of full rationality and efficiency, and with "full *ex post* settling-up" (fully flexible revision of remuneration) by managers for past performance, then "... managerial incentive problems - the problems usually attributed to the separation of security ownership and control of the firm - are resolved", (Fama, 1980: 306).

However, if the managerial labour market fails to resolve the incentive problem, then the *market for corporate control*¹⁷ will apply its "last resort" disciplinary mechanism - the take-over. Notice

¹⁷ By implication at least, it seems that Fama (1980) recognises that the secondary market for shares is not the same market as the takeover market - the market for corporate control.

though, that for either of these markets to work effectively, again we require complete capital market efficiency.

Whilst Fama's reformulation of the neo-classical theory of the firm is an important contribution in the process of up-dating that theory and making it relevant to the modern corporate world, his theory of corporate discipline is also germane to the search for an explanation of merger activity. The issue of contracting between security holders and managers is an important part of the literature on merger activity, particularly for those writers who seek to validate the efficiency and effectiveness of the market for corporate control, (for example, Jensen, 1986a). Assuming Fama's characterisation of the modern firm and his theoretical arguments about the managerial labour market are correct, then why does the disciplinary mechanism of 'last resort' have to be invoked as often as it has been in the UK over the past 25 years? Fama's theoretical approach also fails to explain why we observe periods of intense merger activity, followed by fairly quiescent periods. In other words, Fama (1980) offers no explanation as to why the managerial labour market should be subject to bouts of periodic failure.

5.3 The Hubris Hypothesis of Mergers

Despite these and other objections to market efficiency, most the work in the field of financial economics tends to proceed from an assumption of efficiency. Starting from that position, theoretical formulations in the finance tradition have suggested a variety of motives for mergers, including tax advantages, methods of payment, synergies, undervaluation and asymmetric information, as well as various forms of agency problems. Often these theoretical developments have been conceived as a response to so-called 'anomalous' empirical results. Whilst each of these developments has contributed to the overall understanding of the merger process, they can be thought of as secondary developments and consideration of them is left until the empirical review in the next chapter. However, there are two important theoretical contributions from the financial economics literature which deserve attention here. The first is the hubris hypothesis from Roll (1986); the second is the theory of free cash flow from Jensen (1986b).

The provenance of Roll's hubris hypothesis is to be found in his interpretation of the empirical evidence on merger activity. In particular, he questions the implications and interpretation of an

influential survey of the empirical work conducted by Jensen and Ruback (1983). From their review of some 20 US empirical studies, Jensen and Ruback, relying on the usual assumptions of capital market efficiency, conclude that the market for corporate control generates efficiency enhancing restructuring of corporate assets. This conclusion is used to rebut those drawn earlier in the field industrial economics, which cast doubt on the efficiency effects of the takeover market. By inference, such a conclusion also casts doubt on the efficiency of capital markets. However, Roll (1986) attempts to show that it is not necessary to hold that capital markets are inefficient in order to arrive at an alternative conclusion about the efficiency-enhancing outcomes of mergers and acquisitions. In addition to questioning the conclusions arrived at by Jensen and Ruback, Roll is also troubled by their remark that, "Finally, knowledge of the source of takeover gains still eludes us." (Jensen and Ruback, 1983: 47).

Roll (1986) begins by examining the acquisition process which a rational bidder would be likely to undertake. First, there is the identification of a potential target. Second a value is placed on the target firm, into account the benefits expected to accrue from a take-over. This is derived from private information held by the bidder management, as well as the publicly available information. The final stage involves the decision to bid and at what price. If the bidder's valuation of takeover benefits is less than the current market price, a bid will not be made, if greater, then a bid might be forthcoming. The bid price will probably be pitched somewhere between the market price and the bidder valuation.

Roll's insight focuses on the nature of such a bidding process. If the valuation of the target is viewed as a random variable, with a mean value of the current market price, then it follows that the only bids observed will be those above this price. Valuation errors can only occur in the right-hand side of the price distribution. Next Roll assumes product market and managerial labour market efficiency, and finally that the capital market is efficient in the strong-form: that is, share prices impound *all* public and non-public information. If these assumptions hold, then a takeover bid will only occur when the bidder commits an over-valuation error. In other words, given this set of assumptions, mergers cannot be efficiency-enhancing as Jensen and Ruback, and others, claim. In arriving at such a conclusion the efficient market hypothesis does not have to be abandoned.

The assumption set on which such a contrary analysis is based deserves closer inspection. The requirement that product markets are efficient, that is competitive, seems open to doubt. The traditional theory of the firm offers a variety of oligopoly models, most of which would imply that collusion is at least a plausible outcome. However, some writers, (for example Demsetz, 1973), have argued that structural measures of concentration provide a poor characterisation of competition in product markets. Nevertheless, even if product markets are assumed non-competitive, the situation could be rescued by the existence of a competitive market for corporate control, (Jensen and Warner, 1988). The bidding process in this latter market will eliminate any gains that might arise from the (private) benefits of market power achieved via take-overs. Furthermore, Jensen (1986a) is clear that gains from take-overs do not result from the accretion of market power. Thus Roll's conclusions do not seem to be over-reliant on the assumption of competition in product markets.

Second, consider the assumption of efficiency in the managerial labour market. This too, as outlined above, is an area of some contention. But even if the managerial labour market has a propensity to inefficiency due to factors like information asymmetry, inefficient outcomes might be avoided with appropriate incentive structures and compensation packages. For example, Jensen and Zimmerman (1985: 3) suggest that: "These findings [on the performance-management compensation relationship] are interpreted as generally supporting the view that executive compensation packages help align managers' and shareholders' interests." If this is accepted, then Roll's assumption of efficient managerial labour markets is non-problematic.

Finally, consider the assumption of strong-form capital market efficiency. Even in its semi-strong form, the Efficient Markets Hypothesis is at least open to doubt, (see section 6 below). In its strong-form the validity of the EMH is clearly subject to even greater qualification. These doubts and qualifications are exemplified by Black (1986). In his presidential address to the American Finance Association Black accepts that markets are efficient to the extent that they respond rapidly to information. However, in suggesting that share prices are at best only likely to lie within a factor of 2 relative to their 'true' value, he casts considerable doubt on reliability of share price returns to measure gains (losses) from merger.

This would appear to undermine a crucial element of Roll's assumption set, and thus his hubris hypothesis: and in one sense it does. However, in another sense, this is exactly what he sets out to do. Because, if capital markets are not efficient in the strong-form, it will be possible for profits to be made by acquirers with exclusive access to private information. The implications of this argument require further explanation.

Assume that the takeover premium is viewed as a random variable. Then taking a target's market price as a guaranteed datum ensures that a bidder's valuation error, given strong-form efficiency, must always be negative. In other words, if the capital market is efficient in the strong-form, the acquiring firm must pay a premium in excess of the potential benefits of the take-over. Alternatively, if the market is not efficient in the strong-form, then valuation errors could occur, undermining the putative efficiency of the market for corporate control. Without strong-form efficiency there is high probability of acquiring firms paying too much.

With this in mind, Roll suggests that the following predictions emanate from his hubris hypothesis. First, on announcement of a bid, the market value of the combined assets of the bidder and target should fall; second, the market value of the bidder should also fall; and third, that the market price of the target should rise. He then re-examines the extant empirical work and concludes that there is insufficient evidence to reject the hubris hypothesis, although Roll points out that this hypothesis is unlikely to be able to explain the totality of merger outcomes.

The contribution from Roll (1986) is a particularly interesting addition to the financial economics literature on mergers and acquisitions. In producing a theory of merger activity which is constructed within an efficient markets framework, he derives inferences which, by implication, undermine it. In the process of constructing his hypothesis, Roll also produces a powerful critique of the inconsistent use of assumptions of efficiency in product, labour and capital markets. In addition, the hubris hypothesis offers one explanation of how the actions of management teams can produce wealth losses, while at the same time holding ostensibly wealth maximising objectives.

5.4 The Free Cash Flow Theory of Mergers

Another important theoretical contribution is the free cash flow theory of merger activity developed by Jensen (1986b). Building on the agency cost literature, Jensen provides an explanation for (some) mergers, by focussing on managerial discretion over and abuse of free cash flow. To quote Jensen (1986: 328):

"The theory of free cash flow predicts which mergers and takeovers are more likely to destroy rather than create value; it shows how takeovers are both evidence of the conflicts of interest between shareholders and managers, and a solution to the problem."

The starting point is an assumption set characterising the divorce between the interests of managers and shareholders, together with a lack of competitive pressures in the product and the managerial labour markets. These conditions allow managers to exercise considerable discretion over free cash flows and unused debt capacity. In the presence of cash flows in excess of those required to undertake all positive NPV projects, wealth maximisation requires managers to "disgorge" free cash flows to shareholders. However, following the arguments advanced by Myers and Majluf (1984), Jensen suggests that managers might prefer to retain free cash flow as a means of self-interested "financial flexibility".

Jensen predicts that agency problems associated with free cash flow will be at their greatest when firms have a low potential for organic growth, but simultaneously generate large amounts of free cash flow.³ In this situation managers will be tempted to embark on a variety of unprofitable ventures, including take-overs, rather than reduce their discretionary powers by paying out free cash flow to their shareholders. The mergers theory of free cash flow predicts that unrelated mergers are more likely to lead to losses than those in the same line of business, where synergistic benefits are realised more easily.¹⁸

On the other hand, Jensen argues that take-overs can also serve as a mechanism that can lead to a resolution of these agency problems. If acquirers choose targets with free cash flows which they can put to good use, then they should be able to earn excess returns for both groups of shareholders' returns. This situation is qualitatively different to the situation where managers

¹⁸ However, Jensen does point out that diversifying mergers might be the least damaging prospect for shareholders, and better than managers wasting free cash flows in other ways.

have free cash flow and/or unused debt capacity at their disposal, but do not know what to do with it. Their displacement via a take-over will clearly serve the shareholders' interests.

Jensen argues that an important device for avoiding agency problems associated with free cash flow is the use of corporate debt. With the issue of debt, (particularly to retire stock, Jensen and Smith, 1985; Smith, 1986), managers are forced to pay out free cash flows, under threat of bankruptcy. Jensen is clear that the latter is a much more powerful disciplinary device than those which can be applied by shareholders in the face of failure on the part managers to disgorge free cash flow via an enhanced dividend. Following this proposition, then the theory also has something to say about which type of take-over finance will yield the best results for shareholders. It predicts that the use of cash and debt "... [*ceteris paribus*] will generate larger benefits than those accomplished through exchange of stock. Stock acquisitions tend to be different from debt or cash acquisitions and more likely to be associated with growth opportunities and a shortage of free cash flow ..." (Jensen, 1986: 329).

The free cash flow theory offers a potentially rich source of testable hypotheses about merger activity. Although cast in an efficient markets framework, the theory does allow for the possibility of empirical testing on a basis other than share-price reactions to merger announcements. It thus provides the potential for both industrial and financial economists to reconcile their approaches to the subject.¹⁹ The theory also makes clear that mergers can be at once symptomatic of and also a remedy for agency problems associated with free cash flow. For this reason alone, Jensen's theoretical development represents a welcome contribution to the understanding of merger activity.

6. THE EFFICIENT MARKET HYPOTHESIS

Reference has already been made to the Efficient Market Hypothesis (EMH) and it would worthwhile to elaborate this concept at this point. The EMH is an important element of the financial economics approach to mergers and acquisitions research. Both the construction of theoretical models and the subsequent empirical testing depend on the EHM framework. For

¹⁹ There is, of course, an empirical problem in measuring free cash flow in practice.

example, in the empirical field, abnormal share price returns recorded at the time of merger announcement are taken to be *the* measurement of efficiency gains from mergers, (Jensen and Ruback, 1983). Given the importance of the EMH to financial economics it is reviewed here briefly, relying on two authoritative reviews of the efficiency evidence from Fama (1991) and Herman and Lowenstein (1987). It will be examined in more detail in chapter 3, which deals with research methodology and method.

6.1 Definitions of Market Efficiency

There are three versions of the EMH, (Fama, 1970). The first is weak-form efficiency. Put simply, this says that all information in past prices is incorporated in current prices. In other words, it is not possible to find profitable trading strategies based on past share prices.²⁰ The semi-strong definition of the EMH posits that the current price fully reflects all publicly available information, which is incorporated instantaneously. Finally, strong-form efficiency requires that all information, both public and private is incorporated in the current price.

Before considering the evidence about the EMH, consideration also has to be given to functional definitions of stock markets. Three functions have been suggested as a way of segmenting the stock market, (Herman and Lowenstein, 1987). First, the market for new issues, when firms come to market to raise capital. Second, the secondary trading market, when shares of listed firms are traded between investors. Third, the market for corporate control or takeover market. The essential difference between the three market segments has to do with trading volumes. In the secondary market trading takes place at the margin, i.e. typically only a very small proportion of a firm's shares are traded at any one time. In the other two segments trading takes place for the total number of shares. This needs to be borne in mind, because most of the evidence about the EMH is based on studies of share price reactions in the secondary market. Clearly, evidence of efficiency in one segment does not necessarily imply efficiency in the others. For example, there is substantial evidence that markets for initial public offerings in a large number of countries are

²⁰ If correct, this would suggest that there can be no merit or advantage to what is known as *technical analysis* or *chartism*, whereby analysts seek patterns in past prices from which they try to derive profitable trading strategies. The fact that such analysts continued to be employed and command large salaries, might be taken by some as an indicator of how seriously stock brokers and the like take the EMH.

subject to systematic underpricing, (Jenkinson and Ljungqvist, 1996).

6.2 Support for the Efficient Markets Hypothesis

Examination of the evidence on EMH is made easier by two recent reviews of the issue provided by Fama (1991) and Herman and Lowenstein (1987). The former is broadly supportive of EMH, whereas the latter are highly sceptical. As Fama (1991) points out, the EMH has spawned a voluminous and ever-growing literature which would take too much space to consider in detail here. The arguments that follow are based largely on these two reviews, which are advanced as representative of the contributions by both advocates and critics of the EMH.

Fama (1991) begins his review with a consideration of the definition of an efficient market, settling for the "sensible" version proposed by Jensen (1978: 1575): "... [security] prices reflect information to the point where the marginal benefits of acting on information (the profits to be made) do not exceed the marginal costs". Of course, there is a problem with such a definition if information and trading costs are non-trivial, to the extent that these costs might inhibit the gathering of and trading on information. In such circumstances prices might well not fully reflect the fundamentals, particularly for 'thin' markets.

Of course, Fama is not unaware of these issues, although he regards them as less important than another problem that has dogged research into the EMH, Fama (1991: 1575-6):

"Ambiguity about information and trading costs is not, however, the main obstacle to inferences about market efficiency. The joint-hypothesis problem is more serious. Thus, market efficiency *per se* is not testable. It must be tested jointly with some model of equilibrium, an asset-pricing model. ... As a result, when we find anomalous evidence on the behaviour of returns, the way it should split between market inefficiency or a bad model of market equilibrium is ambiguous."

Fama (1991) divides his review of some 180 empirical studies into three broad categories, according to the three definitions of the EMH. First, weak-form tests (described as tests for return predictability); second, semi-strong form tests (price reactions to information 'events'); and third, strong-form tests (tests for the impact of private information).

In terms of tests for return predictability, Fama finds that empirical studies, particularly those at the early stages, are broadly supportive of weak-form EMH. Whilst traces of serial dependence in stock prices have been uncovered by some researchers, the extent of any anomalies have usually been insufficient to outweigh transactions costs. That is, based on so-called 'filter rules' consistent profits could not be earned on the basis of past prices. However, Fama (1991: 1577) acknowledges some of the more recent work, based on modern econometric techniques, suggests that share-price returns "... are predictable from past returns, dividend yields, and various term-structure variables". That is, the market fails the weak-form test for efficiency. However, Fama suggests these findings are 'controversial', and points out that some critics have suggested that the evidence is the result of "data-dredging" and "sample-specific" conditions, in addition to the joint-hypothesis problem mentioned above.

Turning to the semi-strong definition of EMH and event studies evidence, Fama refers to a number of other reviews. He suggests that event studies "comes closest" to allowing a resolution of the joint-hypothesis problem,²¹ and give "the most direct evidence on efficiency", (Fama, 1991: 1577). In summarising his review of this work, he states that, "With few exceptions, the evidence is supportive [of market efficiency]." (Fama, 1991: 1602). However, earlier he notes that event studies tend to rely on the finding that "... quick adjustment is consistent with efficiency ..." (Fama, 1991: 1601). He also acknowledges that a measurement based on average returns tends to mask the fact that the variance in returns increases around information events. This increased variance could be interpreted as a rational response to increased uncertainty on the one hand, but it might also be considered to be symptomatic of "... irrational but random over and under-reaction to information that washes out in average returns", (Fama, 1991: 1602).

In addition Fama also cites (approvingly), the results from a substantial number of event studies from the merger literature as supportive of the semi-strong version of the EMH. But he does admit that the stylised fact of negative post-acquisition drift in the share prices of acquiring firms, (also recognised elsewhere, Jensen and Ruback, 1983, and reported in many merger studies), is

²¹ This is because these studies have typically relied on the market model, which has the weakness of not being well-grounded in theory, but the advantage of not relying on an assumption of stock market efficiency, (unlike the capital asset pricing model).

inconsistent with market efficiency. Nevertheless, Fama suggests that these anomalous results could be due to measurement bias in computing *ex post* returns.

Fama also reviews strong-form efficiency, but considers it implausible, summarising this view with the following, "... strong inferences about [strong-form] market efficiency would be unwarranted". This might be considered somewhat inconsistent, given that at the beginning of his review he proposes it as a "... clean benchmark that allows me to sidestep the messy problem of deciding what are reasonable information and trading costs".

An interesting feature of Fama (1991) is the shift in definition of the semi-strong form of the EMH, from that set out in Fama (1970), which established the concept in the literature. In the earlier definition semi-strong form efficiency required that stock prices both responded rapidly to new information, but also *fully reflected* that information.²² In Fama (1991) there has been a shift in emphasis such that the latter part of the definition is effectively dropped. However, in the case of event studies based on transactions in the market for corporate control, the requirement for stock price changes to reflect fully any information release is crucial, (Keane, 1983). This is because abnormal returns generated by these studies are relied on when conclusions are drawn about the efficiency enhancing consequences of merger activity, (Jensen and Ruback, 1983; Jensen, 1986a).

If Fama (1991) is taken to represent the position of market efficiency advocates, what is to be made of his review? There is certainly a large body of research evidence which supports the efficiency arguments. From the inferences drawn from the empirical evidence, it is clear that Fama (1991) finds both the quantity of available evidence and the 'empirical regularities' within that evidence sufficient support for a semi-strong version of EMH. Even so, Fama is forced to acknowledge a substantial number of 'anomalies' that could also be claimed to have attained the status of 'empirical regularities'. When these are combined with the joint-hypothesis problem that renders "market efficiency not testable", there is clearly considerable room for doubt. It is certainly possible to arrive at a different conclusion about the evidence. Although whether

²² The term *fully reflect* is generally interpreted to mean that any price response should equate to an unbiased estimate of the present value consequences of an information release.

appeals to 'anomalous' results suffices to 'dis-prove' the efficiency arguments, it is equally difficult to say. A brief examination of some of the counter-arguments follows.

6.3 A Contrarian View of Capital Market Efficiency

An alternative view of capital market efficiency is provided by Herman and Lowenstein (1987). Their contribution appeared as one of a number of papers published in the proceedings of an prominent symposium on the effects of hostile take-overs in the United States. One of the major strands in their arguments is that arguments about capital market efficiency tend to be used inconsistently in the mergers and acquisitions literature, particularly by economists advocating an unrestricted market in take-overs.

Although Herman and Lowenstein (1987) are clearly sceptical about the evidence which has been presented in favour of the EMH. Nevertheless, they are prepared to concede that stock markets are technically efficient, in the sense suggested by Tobin (1984). That is, stock markets are efficient with respect to information arbitrage and respond rapidly to the release of new information. However, they question efficiency in the sense that share prices could reflect the full present value consequences of information events, arguing instead that this form of efficiency is more likely to be a special case rather than the norm.

Whilst they attack the unquestioning assumption of market efficiency, Herman and Lowenstein are at pains to make clear that their stance does not necessarily imply irrationality on the part of agents in the market. Those agents typically employ short time horizons and have to operate in an environment where uncertainty forces them to recognise a tightly constrained field of bounded rationality. Under such conditions, agents tend to employ a very limited definition of efficiency; performance is evaluated with reference to other players, rather than to 'objective', equilibrium values which reflect underlying economic fundamentals, (see also Reinganum, 1992).

Herman and Lowenstein also present a number of questions to those economists who apply the EMH framework in their analysis of mergers. For example, why should large premiums be paid to target shareholders in cases where the acquiring firm has no intention of replacing the

incumbent management team? Efficiency enhancement in such a case could only arise from synergy benefits and the best way to test for these would be by looking at post-merger profitability, rather than at share-price reaction to an announcement of the merger.²³

One answer to this might be to suggest that efficiency enhancement could also be derived by changing the incumbent managers' contracts post-merger. Porter (1987) cites Hanson Trust as an example of an acquisitive firm which typically introduced radical transformations of managerial contracts, following a take-over, rather than institute wholesale dismissals.

Another issue posed by Herman and Lowenstein (1987) is that the stated intentions of bidders, are often inconsistent with an efficient markets framework. That is, efficiency enhancement often does not appear to be an explicit motive for merger proposals. They also point to the role of take-over specialists and arbitrageurs who operate within the capital markets in a rent-seeking capacity, and whose large commissions, fees and profits should be weighed against any claims of economic benefits.²⁴

What can be made of the arguments from Herman and Lowenstein (1987)? By themselves the arguments, (even with the aid of the empirical research used to sustain them), cannot not 'prove' 'inefficiency' in stock markets, and the market for corporate control in particular. However, Herman and Lowenstein (1987) do raise important issues and point to a considerable number of anomalies which need to be addressed. More specifically, their arguments suggest that any assumption of market efficiency, in the sense of share-price reactions fully reflecting present value consequences of information event, needs to be treated with caution.

7. SUMMARY AND CONCLUDING REMARKS

The purpose of this chapter was to provide a context and framework for the research to follow. In addition to setting out the aims of the current project, the chapter presented an overview of

²³ In fact, whilst agreeing broadly with the thrust of this argument from Herman and Lowenstein (1987), an alternative method of testing via the event study technique has been suggested by Chatterjee (1992).

²⁴ See Baumol (1991) for an analysis of rent-seeking activities in the case of leveraged buy-outs.

aggregate UK merger activity for the sample period (1980-90), together with data on the types of merger and the consideration paid by acquiring firms. The aggregate data revealed that the sample period can be divided into two halves: 1980-85 representing a period of relatively low activity, followed by very high levels of merger activity during 1986-90. Some of the more salient features and developments in the UK market for corporate control were also examined briefly. These included the rise in hostile takeover activity and divestment of peripheral activities by many of the UK's largest firms. The strategic impact of the EU Single Market programme was also referred to.

It was noted that horizontal mergers were the dominant type of combination in the UK, which is in some contrast with the US, the only other country with a highly developed and active market for corporate control. This difference between the two countries was seen to be due largely to the differing regulatory regimes. Until the Reagan Administration in the US, merger policy was dominated by a market structure approach, which was strictly interpreted and rigorously enforced. In the UK, legislative provision has been drawn up with a neutral stance, with the burden of proof set so that the regulatory authorities have to demonstrate that a merger is against the 'public interest' before it could be prevented. In the event, only approximately 3 per cent of eligible mergers are referred for investigation. Although in 1984 the focus of UK merger policy and the basis of referral was re-stated *explicitly* in terms of the impact of a proposed merger on competition, horizontal mergers continued to dominate and represent over 60 per cent of the total.

Following examination of aggregate merger patterns and the regulatory environment, the remainder of the chapter was concerned with setting a theoretical context. Following Jensen (1986a), the market for corporate control was characterised as the site where rival management teams compete for control of corporate assets. Since the seminal contribution of Manne (1965), the theoretical *raison d'être* for takeover activity has been represented as a disciplinary mechanism against inefficient and ineffective corporate managements. Indeed, in its 1988 white paper, *Merger Policy*, the UK government made explicit reference to this disciplinary market mechanism as the corner-stone of its policy. It has been argued that, on average, mergers and acquisitions are efficiency-enhancing events which create value by management displacement

and unspecified synergies, (for example, Jensen and Ruback, 1983; Jensen, 1986a).

However, an alternative view was also considered, which questioned the adequacy and potency of the disciplinary threat from the market for corporate control. Assuming that the prospect of takeover and loss of office is a potent threat against management inefficiency, it still remains to be explained why the threat should be realised on the scale observed. It is also to be explained why takeovers fluctuate so dramatically over time and why takeover waves are highly correlated with stock market levels. In other words, the disciplinary theory of takeovers fails to explain why the discipline has to be invoked more often in some periods than in others.

A slightly different theoretical perspective due to Fama (1980) was also examined. This argued for the managerial labour market as the primary disciplinary mechanism. Under this formulation the the market for corporate control is relegated to the "discipline of last resort". Again, the extent to which this disciplinary mechanism is resorted to, suggests that considerable principal-agent problems exist in the modern corporation, and that internal control mechanisms tend to be unreliable. To some extent this echoes the thrust of earlier managerialist theories of the firm, (Marris, 1964; Mueller, 1969; Gort, 1969; Aaronovitch and Sawyer, 1975), which were also examined. Taking the divorce between ownership and control as the starting point, these theories suggest that rather than imposing a market discipline on inefficient management teams, mergers and acquisitions are more likely to be undertaken in pursuit of managerialist objectives such as growth.

The potential for mergers to be a symptom of principal-agent problems rather than their cure can also be found in the free cash flow theory of merger activity, (Jensen, 1986b). However, unlike many of the managerialist theories, (apart from Marris, 1964), the free cash flow theory suggests that under certain circumstances mergers and acquisitions might correct principal-agent problems. This is achieved when free cash flows are brought under the control of acquiring management teams, which then put them to higher value uses.

The hubris hypothesis, (Roll, 1986), provides an alternative theoretical formulation, which suggests that (some) mergers can be explained by the willingness of bidder management teams

to commit valuation errors. What is particularly interesting about Roll's hypothesis is that it predicts that good performance prior to a bid could precipitate over-valued bids, and that such bids need not necessarily be launched by managers acting in their own self-interest.

Finally, some of the arguments about market efficiency and the efficient market hypothesis in particular were examined briefly. The EMH is an essential assumption of approaches from financial economics and the event study methodology, with typical claims for the efficiency-enhancing benefits of mergers dependent on abnormal return measures derived directly from the efficiency assumption. However, the examination of two EMH reviews by Fama (1991) and Herman and Lowenstein (1987) exposes an number of issues, not the least of which is the problem of the dual hypothesis which means that strictly the EMH is not testable. This, together with a growing body of anomalous evidence suggests that considerable care must be taken when efficiency arguments are invoked.

Having set the theoretical context, regulatory environment, and characteristics of the UK market for corporate control, the next chapter will provide a detailed examination of the empirical literature. This is followed by a chapter concerned with issues of methodology and method; which is in turn followed by four chapters which present the empirical results which form the substance of the current study.

CHAPTER 2

A Review of the Empirical Literature

1. INTRODUCTION

This chapter presents a critical review of the empirical literature on mergers and acquisitions. The review will highlight areas where a broad consensus has been achieved and others where there is still considerable disagreement. In particular, the disagreement between the results from the industrial economics tradition will be contrasted with those from field of financial economics.

The opening section provides a link between the theoretical literature discussed in the previous chapter and the empirical review that follows. It then traces briefly the evolution of research work in the field, and concludes with a reminder of the regulatory differences between the UK and the US, which need to be borne in mind when interpreting empirical results from the two countries.

Sections 3 and 4 review the research from industrial economics, which by and large has utilised accounting data to address questions concerning the economic consequences of mergers and acquisitions. This research has involved two approaches: first, attempts to discriminate between the financial characteristics of acquiring (bidders) and acquired firms (targets);¹ and second a comparison of pre-acquisition and post-acquisition performances.

In Section 5 attention switches to the empirical research from financial economics. Here share price data is employed to assess the impact of mergers and acquisitions on the wealth effects for the shareholders of bidders and targets. Section 6 considers the impact that the divorce between

¹ Most research work (including the present study) focuses on completed mergers and so the terms acquired and acquiring are used interchangeably with the terms bidders and targets. Where the focus of attention is on unsuccessful bids, only the terms bidders and targets will be employed, and this will be made clear in the text.

ownership and control might have on management incentives with respect to mergers and acquisitions. The chapter concludes with a summary of the evidence and presents a short analysis that gives rise to the specific aims of the current study.

2. THEORETICAL & REGULATORY CONTEXT

2.1 From Theory to Empirical Evidence

Chapter One provided a review of the major developments in the economic theory of mergers and acquisitions. In broad terms, the industrial economics tradition has produced theories which suggest that merger activity is likely to be driven (at least to some significant extent) by strategies aimed at the acquisition of market power for purposes of managerial utility, rather than the maximisation of shareholder wealth. By implication these theories also suggest outcomes which are likely to lead to a diminution of welfare. In contrast, theories from financial economics have tended to emphasise the role of an efficient market for corporate control, which results in mergers driven by motives to discipline inefficient management teams and to increase shareholder wealth.

This classification of the theoretical literature is, of course, rather crude. For example, the free cash flow theory of mergers, (Jensen, 1986b), emanates from modern developments in financial economics. Nevertheless, it has a clear resonance with the managerial theories of the firm that emerged from an earlier literature, also concerned with the effects of the divorce between ownership and control, (Caves, 1989:163). Even so, this classification of the theoretical work on mergers will be helpful in developing the review of the empirical work. For, as will be seen, the theoretical differences that exist between the two fields of economic enquiry also extend to the empirical research domain, (Bradley, 1987; Caves, 1989; Jensen, 1992; Chatterjee and Meeks, 1996)

2.2 Do mergers increase value, profits and efficiency?

It is the search for an answer to this question which motivates most of the empirical research in the field. Despite the vast amount of empirical research into these matters, as Mueller (1989:1) suggests, "... we have more, detailed information about mergers than we do for many other corporate decisions.", the answer to the question is in many respects as elusive as ever. On

balance, the studies of *ex post* efficiency effects from the industrial economics literature suggest negative outcomes, (Caves, 1987). In contrast, the *ex ante* studies from financial economics show corporate re-structuring via mergers and acquisitions to be value enhancing, (Jensen and Ruback, 1983).

However, there are studies from within both traditions which contradict the mainstream results, and at the same time suggest that considerable empirical research is left to be done. This said it is perhaps surprising to note that, whilst efforts have been made to research the apparently anomalous results within each field, there appears to have been little effort made by researchers to reconcile the differences that exist between the results of the two traditions in economics. This issue forms part of the core of the present study.

2.3 Development and Categories of Mergers Research

Ignoring the research which focuses solely on the public policy aspects of mergers, it is possible to identify a number of distinct stages in the development of and approaches to the empirical work on mergers and acquisitions. The approaches taken can be divided into four broad categories:

- ▶ investigations of pre and post-merger profitability;
- ▶ examination of the financial characteristics of acquired and acquiring firms;
- ▶ case studies of the effects on productive efficiency;
- ▶ investigations of the shareholder wealth effects.

In terms of the evolution and development of the empirical research, a review of the industrial economics literature shows that the earlier work was dominated by the first three approaches. Latterly, the wealth effects or event studies from the finance literature has come to dominate the empirical research effort. This shift in the research paradigm is explained by Caves (1989:151):

".... this line of business [ex post profitability and efficiency studies by industrial economists] fell prey to a successful take-over raid in the past decade by the field of finance, using the methodology of excess or abnormal stock market returns for determining the value and (by inference) the effects of mergers and take-overs. This

technique was a genuine innovation - theoretically well grounded, cheap to execute, and able to evade the problem of holding constant other factors that plagues ex post studies of mergers' effects. A better product, available at a lower price, naturally swept the intellectual market-place."

The empirical results from each category will be reviewed in turn in sections 3 to 5.

2.4 Sources of Mergers Research

The UK and US have by far the highest incidence of merger activity of any of the developed capitalist economies; they also have corporate sectors which are very reliant on their respective capital markets. Unsurprisingly, most of the empirical research has focused on mergers and acquisitions in those two countries, and the following review will reflect this.² Although the present study is based on UK mergers and acquisitions, it is necessary to review the evidence from the US, because the volume of evidence from that source far outweighs that from the UK and many of the innovations in research methods and techniques have emanated from the US.

Although the US evidence has important implications for the present study, when interpreting the evidence from that source it is important to recognise (as was seen in Chapter One) that the regulatory regimes of the two countries are very different. For example, in the US, before changes introduced by the Regan Administration in 1981, horizontal (and to a lesser extent vertical) mergers were virtually prohibited and so conglomerate mergers tended to predominate. In the UK, the regulatory regime has not been determined as strictly in terms of market structures and, perhaps as a result, horizontal mergers predominate here.³

Another difference in the respective mergers policies of the two countries concerns the 'burden of proof', if and when the regulatory mechanisms are activated. In the USA it is incumbent on the merging firms to show that a proposed merger will not damage 'the public interest'. In the

² For empirical work on mergers in other countries see, for example, Mueller (1980), Hoshino (1982), Odagiri and Hase (1989), Firth (1997).

³ The introduction of the Thirteenth Directive on Takeovers means that, since September 1990, the Commission of the European Communities (specifically the Merger Task Force operating under the aegis of DG IV) now has a role in the regulation of mergers in the UK.

UK the 'burden of proof' is reversed, with the regulatory authorities having to show that a proposed merger is against the 'public interest' if it is to be denied.⁴ As Cosh, Hughes and Singh (1980:227) point out, "... there have been few antitrust and other restrictions on the market for corporate control in the United Kingdom. This country therefore provides a unique opportunity to study the nature and efficiency of such a market." Typically in the UK, fewer than 3 per cent of the merger proposals which qualify for investigation by the Monopolies and Mergers Commission are actually referred to that body, (Clarke, 1985).

With these differences in the regulatory environment of the two countries in mind, the review of the empirical evidence follows.

3. FINANCIAL CHARACTERISTICS RESEARCH

3.1 Theoretical Basis of Financial Characteristics Research

This form of research attempts to discriminate between acquiring firms (AGs) and acquired firms (ADs) by means of the financial characteristics drawn from the respective accounting records. It can be characterised as an early attempt by (mainly) industrial economists, to test the disciplinary hypothesis of the market for corporate control, developed from the work of Manne (1965). This involves testing the hypothesis that in an efficient takeover market, acquiring firms should be more efficient than the firms that they acquire.

Despite the shortcomings of accounting data, (discussed in detail in Chapter 3), these studies have the virtue of being a direct test of the disciplinary hypothesis, (whereas share price data only affords an indirect test). It is assumed that accounting data record the economic fundamentals of the firms involved, and that these fundamentals drive share price performance, which in turn provides the signal for takeover activity. Therefore an examination of financial characteristics drawn from accounting data will provide a valid test of the workings of the market for corporate control, (Singh, 1975).

⁴ The rather more onerous regulatory framework in the USA prior to 1981 may well have acted as a screening device preventing consummation of the more obviously profitable mergers, (such as horizontal mergers which could have provided opportunities for increased market power).

There is now an extensive 'market based' accounting research literature which suggests that accounting information does indeed provide price sensitive signals to the stock market, (Walker, 1991.) However, given that share prices in an efficient market represent market agents' views of future performance, and that accounting data only provide an historical representation of a firm's performance, there is clearly room for doubt about the validity of such a test of the efficiency in the market for corporate control, (see section 3.1 below for a discussion of this issue).

Nevertheless, this research is based on the (implicit) assumption that there is a direct and systematic relation between share prices and accounting data. Following the seminal work of Ball and Brown (1968), market based accounting research has confirmed a positive and significant correlation and response between accounting earnings and movements in share prices, (Beaver, Lambert and Morse, 1980; Beaver, Clarke and Wright, 1987). Whilst new accounting information might well provide price-sensitive data to the takeover market, this does not necessarily mean that there is a one-to-one mapping from accounting to share price data. As Lev (1989) points out, typically accounting earnings have low explanatory power in the determination of share prices; a consistent finding for the twenty years of research which he reviews. Even so, this form of research is based on the assumption that accounting data provides a valid means of discriminating between AG and AD.

Typically, the financial characteristics tested include various measures of profitability and rates of return, growth rates, liquidity, retention ratios, gearing, and the valuation ratio. The statistical techniques applied to this data include both uni-variate and multi-variate analysis, with direct comparisons made between AG and AD, and control groups and industry averages.

The discriminant research methodology was used extensively in the UK during the 1970s and 1980s, but it found rather less favour in the US, where it quickly gave way to the event study methodology. The review focusses in the main, therefore, on the empirical evidence from UK studies, although some reference is made to results from the US.

3.2 Acquired Firms versus Control Group Firms

Uni-variate analyses of AD versus control group comparators, find that typically AD are smaller,

(Singh, 1975; Meeks, 1977; Kumar, 1984; Levine and Aaronovitch, 1981). Similarly, when the discriminating variable is firm growth, the AD population is on average less dynamic, (Cosh, Hughes and Singh, 1980; Levine and Aaronovitch, 1981; Kuehn, 1975). However, when profitability is the discriminator variable, the evidence is very mixed, and in the words of Hughes (1989:66-7):

"There is not therefore a systematic tendency for the acquired to be less profitable than the average company, and in the case of non-horizontal acquisitions there is some suggestion that they are above-average performers."

In a multivariate analysis incorporating both firm-specific and industry-specific factors, Powell and Thomas (1994) report a high overall level of discrimination 'within sample', although their model had a bias to the correct identification of non-AD firms, rather than targets. However, Powell and Thomas do suggest that 'out of sample results' would be unlikely to generate a profitable investment strategy. Even so, their results do point to targets being smaller, cash-starved and less profitable than the general population of firms.⁵

Thus evidence of target under-performance relative to various control benchmarks is rather mixed. Whilst some UK studies suggest that targets are inefficient compared to industry averages or the general population, a finding consistent with the disciplinary hypothesis, most suggest otherwise.

The findings from US studies are also rather mixed on this issue. For example, Bannister and Riahi-Belkaoui (1992), for the period 1977-89, find that targets underperformed industry averages for both cash flow and earnings as ratios of total assets. However, their sample of 69 targets was rather small. In contrast, Matusaka (1993) produces large sample evidence that targets had profit rates significantly greater than industry averages. This result confirms the earlier finding from Ravenscraft and Scherer (1987), that targets were typically highly profitable

⁵ This is consistent with the disciplinary hypothesis, and with results from Kennedy and Limmack (1996). The latter use share-price results as a pre-bid performance indicator, and report significant underperformance compared to the market index, for a 1980-89 sample of 345 targets.

prior to takeover.

3.3 AG Firms versus Control Groups

The evidence on AG versus controls suggest that there is a tendency for AGs to be larger and more dynamic, (Cosh, Hughes and Singh, 1980; Levine and Aaronovitch, 1981; Meeks, 1977; Utton, 1972; Kuehn, 1975; Kumar, 1984). As with the findings on AD versus comparators, evidence on profitability is again rather mixed, but on balance AG seem to be as profitable and perhaps slightly more profitable than the control groups, (Meeks, 1977; Cosh, Hughes and Singh, 1980; Levine and Aaronovitch, 1981). However, when samples have been divided by relatedness, AG which have been engaged in horizontal mergers have average or below average profitability records, whereas those engaged in diversifying mergers have average or better than average pre-merger profitability, relative to controls, (Cosh, Hughes and Singh, 1980; Meeks, 1977).⁶

3.4 Acquiring versus Acquired Firms

Suggestive though these findings might be, the crucial aspect of the financial characteristics research concerns direct comparisons of AG firms and the firms they acquire. Even if AG are only as efficient, (or even less efficient) as control groups of non-acquirers, provided it can be demonstrated that they are clearly more efficient than AD, then the market for corporate control could be thought to be fulfilling a useful function.

In an important contribution to the industrial economics literature, Singh (1975) analysed two sample periods, 1955-60 and 1967-70. On a uni-variate basis, his results show that in the earlier period, size, profitability and growth are all significant discriminators between AG and AD groups. For the later period, however, (a peak in merger activity) profitability and growth were no longer found to be significant discriminators, although the two-year change in profitability prior to acquisition was significant. Size continued to be the most important discriminator. These results are broadly consistent with the findings of Meeks (1977) and Cosh, Hughes and Singh (1980), but not with the evidence from Rose and Newbould (1967), Levine and Aaronovitch

⁶ Despite the shortcomings of univariate analysis, this is potentially an important result, given that over a long period the majority of mergers in the UK have been of the horizontal type, and that *prima facie* horizontal mergers give rise to obvious concerns about increases in market power.

(1981), and Newbould (1970).

Examining the multivariate results, size rather than profitability is by far the most important discriminator, a result consistent across all studies. When profitability, change in profitability, liquidity, growth, and gearing variables are added to size in the multivariate discriminant function of Singh (1975), discriminatory power is only increased by 8%. Similarly, in Levine and Aaronovitch (1981), adding performance variables to size, only increases discriminatory power by 7%. Thus size and not profitability emerges as the most successful means of discriminating between AD and AG.

3.5 A Summary of the Financial Characteristics Evidence

As this brief review of the financial characteristics research demonstrates, it has proved very difficult to discriminate between AG firms and AD firms. The starting point of this research, (the disciplinary hypothesis), was the premise that an efficient market for corporate control would give rise to a meaningful distinction between the financial characteristics of the two groups. While some small degree of overlap between the respective characteristics sets might be expected and regarded as 'noise', the extent of the overlap typically observed is not consistent with the disciplinary hypothesis. This leads Hughes (1989:73) to the conclusion that

"For all these reasons, therefore, we should expect that the market for corporate control will be at best a highly imperfect disciplinarian."

Nevertheless, despite the weight of the evidence, some caution is required. As pointed out at the beginning of this section, this strand of research is subject to a number of difficulties often encountered when using accounting data in economic research. Alternative research and evidence is clearly required before arriving at definitive conclusions about the efficiency effects of mergers and acquisitions.

4. PRE- & POST-MERGER PROFITABILITY STUDIES

4.1 Theory and Profitability Studies

The use of accounting data is also to be found in an alternative strand of research based on

comparisons of pre- and post-merger profitability performances of the firms involved in merger transactions. As with the financial characteristics work, this type of research flourished during the 1970s, but since then has also been largely superseded by the event study methodology of financial economics. For this reason, these studies are often given little credence by those working within the financial economics tradition, particularly in the US, (for example, Bradley, 1987). Nevertheless, these studies do form a significant part of the empirical literature on mergers and as such are worth consideration; the more so as their findings are often at odds with the results of the recent wealth effects studies reported in the financial economics literature. These profitability studies are, therefore, of more than just passing interest for the present study.

Most profitability studies take hypotheses developed from managerial theories of the firm as their point of departure, (for example, Meeks, 1977). In addition, these studies were also concerned with public policy approaches to merger control. However, this research method only provides an indirect test of the disciplinary hypothesis of the market for corporate control. Whilst it might be expected that, *ceteris paribus*, an efficient market for takeovers would ensure that the profitability of merged firms is likely to be greater than the profitability of the firms involved as independent entities, it does not follow necessarily that such a result would be consistent with the disciplinary hypothesis. Such profit improvements could be due to reasons other than improved management, for example enhanced market power.

Once again the use of accounting data is likely to be somewhat problematic. Given the legitimate ability of corporate management teams to 'manipulate' or 'window-dress' accounting profits, (Griffiths, 1986), assessing whether post-acquisition changes in profitability really do reflect the true underlying cash flows can be a serious problem, (Chatterjee and Meeks, 1996). Furthermore, whether post-acquisition profitability of the combined entity is superior to the joint pre-acquisition profitability of the independent firms is not really the question that should be addressed. The imponderable counterfactual question - what would profitability have been in the absence of merger? - is obviously more germane.

If the focus were to be the impact on productive efficiency, which might be more appropriate from a public policy perspective, then gleaning productivity effects from accounting data

becomes even more problematic, (Cubbin and Hall, 1979; Meeks and Meeks, 1981).

Clearly such issues need to be borne in mind, but given that all research methodologies and methods suffer from drawbacks, there might still be merit in the pre- versus post-acquisition profitability approach. The review of this work divides the research into two categories: large sample data studies and case studies.

4.2 Large Sample Studies in the UK

Singh (1971) tested a sample of 77 mergers over the period 1955-60, using a measure of profitability corrected for the average industrial rate of return, (i.e. what financial economists might regard as a crude adjustment for systematic risk). Against this measure, he found that approximately half the combined firms suffered a decline in profitability following merger. Meeks (1977), produced very similar results for a larger sample of 233 mergers over the period 1964-72. Of these between a half and two-thirds of acquiring firms suffered a significant post-merger decline in profitability for a period of up to 7 years. Utton (1974), used a matched sample of 39 merged firms and 39 control firms for the period 1961-70, and also demonstrated a profits decline, against median profitability for over half his sample. He also found that when compared to firms which had grown internally, merger intensive firms had achieved significantly lower profitability.

Newbould (1970) employed survey methods for a sample of 38 acquiring firms, and also compared the performances of merger intensive and non-merging firms. His results are very similar to those of Singh (1971), Utton (1974) and Meeks (1977), with over half the sample of merger-intensive firms failing to achieve synergistic gains. Furthermore, Newbould (1970) concluded that management tended to gain more from merger than their shareholders, who often suffered losses in earnings per share and reductions in share prices. A result broadly in line with predictions from managerial theories of the firm.

Kumar (1984), analysed data on post-merger profitability for 354 UK listed firms for the period 1967-74. In line with the results from these earlier studies, his results suggest a general tendency for a decline in post-merger profitability for a period up to 7 years after merger, but he also

reported profit improvements in a minority of cases.

In contrast, more positive results were reported by Cosh *et al* (1980). For a sample of 300 acquisitions, in the period 1967-69, they found that AG firms achieved statistically significant post-acquisition profitability improvement. This meant that AG firms then had profitability similar to that achieved by a non-merging control group of firms. Their results also showed that the pre-acquisition profitability of AD firms 'was distinctly less favourable than that of their matched control group', (Cosh *et al.*, 1980:257). A result that is consistent with the view that, in the market for corporate control, it is the strong which take over the weak.

Positive results were also reported by Manson *et al.* (1993) for a sample of 38 acquisitions between 1985 and 1987. Using a measure of operating cash flows standardised by industry medians, they compare proforma cash flows for the AD and AG firms for 5 years prior to acquisition, against 5 years post-acquisition. Regressing pre-acquisition cash flow against post-acquisition cash flow, and interpreting the estimated regression intercept as a measure of the average gains, Manson *et al.* report significantly positive gains. They also find that the shareholder wealth effects at announcement were positively related to the estimated operational cash flow effects, significant at the 5 per cent level.

In a more recent study aimed at gauging the impact that changes in accounting standards have had on reported post-merger profitability, Chatterjee and Meeks (1996) examined 144 acquisitions over the period 1977-90. They divided their sample at 1984 to allow for changes to accounting standards (SSAP 22 and SSAP 23) which permitted acquiring firms much greater discretion over the way in which the assets of the AD firms were consolidated.⁷ On the basis of these regulatory changes alone, Chatterjee and Meeks predicted that post-merger profits would increase after 1985. Their results confirm this prediction. In the case of mergers completed during 1977-84, changes in profitability were statistically insignificant for a period of 8 years post-merger. In contrast, for mergers completed during 1985-90, post-merger profitability change

⁷ Subsequently, both regulators and the accounting profession acknowledged the abuse that this additional discretion might have given rise to and new accounting regulations, FRS6 and 7, have reined in the discretion over post-merger valuation.

was positive and statistically significant. Accordingly, Chatterjee and Meeks advanced the tentative conclusion that the results from the 1985-90 period were likely to have suffered from serious distortion.⁸ However, they also pointed out that changes in accounting standards meant that it was extremely difficult to draw strong conclusions about post-merger performance during this period.⁹

In the most recent large scale UK study, Dickerson *et al.* (1997) examined the post-merger performance of 613 acquirers, over the period 1948-77. Their method involved the utilisation of the profitability 'persistence' approach from Geroski (1988), which involved using a lagged measure of the dependent variable (pre-tax return on assets) as an explanatory variable, together with measures for business cycle effects, leverage, industry, size and growth. The results were robust to a variety of changes in specification, and show unambiguously that acquirers suffered a 'systematic detrimental impact on company performance', (Dickerson *et al.*, 1997:359). However, as they point out, their study did not provide any explanation for the poorer performance.

4.3 The Case Study Approach

In another important contribution to the industrial economics literature on mergers in the UK, Cowling *et al* (1980) point out, that the methodology employed in these early profitability studies is potentially very problematic. Changes in profitability, even relative to an industry average, could be brought about for reasons other than efficiency considerations. For example, changes in either input or output prices could result in either increases or decreases in reported profit. Cowling *et al* therefore set out to test for efficiency changes directly by using an input-output productivity measure, first suggested by Farrell (1957), and refined by Cubbin and Hall (1979).

In none of a number of intensive case studies undertaken could any substantial efficiency gains be demonstrated. Furthermore, in two-thirds of cases they reported a significant decline in

⁸ A view consistent with the study by Higson (1990).

⁹ Since 1990, the Accounting standards Board has introduced sweeping changes to the ways in which acquiring firms must deal with consolidation.

productive efficiency. This was particularly surprising, given that the majority of cases investigated involved horizontal merger, where, *ceteris paribus*, one would expect synergistic gains to be more readily obtained. Cowling *et al* (1980) conclude that overall, the evidence from their case studies was suggestive of 'X-inefficiency', (Leibenstein, 1966), abuse of market power and 'feather-bedding' (a lack of competitive product market discipline).

4.4 Interpreting the UK Profitability Evidence

Persuasive though the case-study evidence from Cowling *et al.* (1980) might appear to be, given the data requirements of such an approach, and the problem of generalising from a limited number of cases, perhaps more weight should be placed on the results from the large sample studies. (A similar caveat about sample size might also be applied to Newbould (1970) and Manson *et al.* (1993).) This leaves the studies by Singh (1971), Utton (1974), Meeks (1977), Cosh *et al* (1980), Kumar (1984), and Dickerson *et al.* (1997).

At the outset it has to be admitted that the problems of accounting data and the unanswerable counter-factual can always be used to cast doubt on the value of any post-merger profitability study, (Bradley, 1987). Nevertheless, the evidence, though certainly not conclusive, does at least call into question the efficiency and effectiveness of the market for corporate control in disciplining corporate managements and re-allocating productive assets. This is summed up succinctly by the Department of Trade and Industry (1988:38):

"Evidence on post-merger performance that has emerged supports the earlier findings of disappointing or inconclusive performance. Indeed, the consistency of the results of the various studies and the wide range of approaches used tends to reduce the force of the methodological limitations and to increase the robustness of the findings."

An alternative explanation might be that these *ex post* studies have been predicated on too simplistic a view of the disciplinary mechanism and ignore the potency of the takeover *threat*. In order to be an effective discipline, that threat simply has to be credible, it does not necessarily have to be realised in the form of actual takeovers.¹⁰ For example, results from Pickering (1983)

¹⁰ As Pickering (1978) pointed out, the number of merger bids exceeds the number actually consummated.

and Holl and Pickering (1988) suggest that although completed mergers might demonstrate a tendency to have adverse impacts on profitability, unsuccessful bids can have positive impacts on the performances of both targets and bidders following abandonment of a bid. Thus it would be possible to conclude from this that the threat of takeover can be a stimulus to managerial performance, even if actual takeover has a general tendency to lead to a decline in performance.

More recent research into the issues raised by abandoned mergers tend to have been conducted with event study methodology and share price data. The studies by Firth (1980), Parkinson and Dobbins (1993), and Limmack (1994) all show abandoned targets making and sustaining positive returns, with rather more mixed results for bidders. In the most recent UK study Holl *et al.* (1997) find that targets in both related and unrelated abandoned bids make and retain substantial gains for up to 2 years post-abandonment, although the latter have higher gains than the former. Both groups of bidders make significant losses, which increased over 2 years after bid failure, with related bidders faring worst. Holl *et al.* conclude that these results are consistent with an information based explanation, wherein the stock market revalues the targets in the light of the new information released by the bid.

This view receives some support from the US, (Dodds and Ruback, 1977), although the study by Bradley, Desai and Kim (1983) supports a synergy explanation for the retention of target gains in abandoned mergers.¹¹ Regardless of the source of gains, overall these results do provide support for the potency of the takeover threat and thus for the beneficial impact of the market for corporate control.

Despite this sort of evidence from studies of *abandoned* bids, the weight of evidence from the UK profitability studies is overwhelmingly against the hypothesis that *completed* mergers lead to increases in productive efficiency and profitability. From this it is therefore possible to draw the inference that the UK market for corporate control is at best an 'imperfect disciplinarian'.

¹¹ Bradley, Desai and Kim (1983) find that only if a target is subsequently acquired within 5 years of the original (abandoned) bid does it retain gains. For those not acquired within this 5 year period the announcement gains are dissipated within 2 years.

4.5 US Evidence on Post-merger Profitability

The negative conclusions about post-merger performance in the UK are considerably reinforced by a recent US profitability study. Ravenscraft and Scherer (1989), using the Federal Trade Commission line-of-business data on 251 mergers during the period 1968-74, set out to test two specific hypotheses, drawn directly from the market for corporate control theory. First, that AD firms have relatively poor pre-merger profitability; and second, that mergers, on average, improve profitability.

In their results they find no systematic evidence for the first hypothesis, and the second is only supported in a minority of special cases of "mergers of equals".¹² Furthermore, they find that in the US, in the late 1960s to early 1970s, there was a clear bias towards targets being highly profitable, the more so the smaller the AD firm relative to the AG firm.

This is potentially an important piece of evidence. The line-of-business data captures take-overs of unlisted firms by larger, listed corporations. Most studies only include listed firms in their samples of AD and AG, and therefore incorporate a sample selection bias.

The evidence from Ravenscraft and Scherer (1989) demonstrates overall a decline, rather than an improvement in post-merger profitability, and this they attribute to:

".... control loss owing to more complex organisational structures and lessened managerial competence and/or motivation. This control loss explanation is consistent with the high incidence of divestiture following acquisition and the tendency of sold-off units to have negative operating income in the year before their divestiture." (1989: 115)

When coupled with an earlier conclusion, "... there is no broad-gauged support for the 'inefficient management displacement hypothesis' that acquired companies were sub-normal performers", (Ravenscraft and Scherer, 1989:105), their evidence is remarkably similar to the earlier *ex post* profitability studies on mergers carried out in the UK.

¹² That is when the AG and AD firms are of comparable size.

However, in an earlier study, (Ravenscraft and Scherer, 1987a), again using line of business data, examined 96 tender offers during the period 1950-76 and found that on average target firms had a slightly worse than average performance. Nevertheless, as with their later study, post-acquisition performance declined, although the result was not statistically significant. In the same year they published the results of another study, but this time of 471 mergers over the same period, (Ravenscraft and Scherer, 1987b). In this case they report a substantial and statistically significant decline on post-merger profitability, based on pre-merger performance, with no significant improvement against a non-acquiring control group.

In a study of 56 hostile take-overs during the period 1975-83, Herman and Lowenstein (1987) also produce negative results. They found that typically acquirers were twice the size of the target, but that, on average, the targets were more profitable and had a faster rate of growth prior to acquisition. However, when the acquirers and targets were matched, they report that only 45% of targets outperformed their eventual acquirers pre-acquisition by a meaningful margin. A particularly interesting feature of Herman and Lowenstein's results is their finding that in the late 1970s hostile take-overs appeared, in general, to improve performance, but in the early 1980s, post-acquisition profitability declined substantially. They argue that institutional factors and time-specific phenomena are likely to have played an important part in the determination of whether take-overs succeed.

In contrast, Healy *et al.* (1992) examined the post-merger cash flow performance of 50 of the largest combinations between 1979 and 1984 and found significant improvements in asset productivity. This led to improvements in operating cash-flow performance, with the improvements positively related to abnormal stock returns at announcement. The improvements were also positively related to the degree of relatedness of the AD and AG firms. Similar findings of post-merger improvements in cash flow and operating profits are supported by the US studies of Weston and Masinghka (1971) and Switzer (1996).

4.6 Conclusions from UK and US Profitability Studies

Whilst there are profitability studies in the literature which report a positive impact on *ex post*

profitability due to mergers, (Cosh *et al.*, 1980 in the UK; Weston and Mansinghka, 1971; Healy *et al.*, 1992; Switzer, 1996 in the US), the weight of evidence is overwhelmingly negative.

Nevertheless, caution is required when drawing inferences from this body of research evidence. For, as Meeks and Meeks (1981) point out, using measures of accounting profit as indicators of post-merger performance improvement is problematic. This is particularly so in the case of acquisitions that provide opportunities for increased market power. In such a case it becomes virtually impossible to disentangle the impact of changes in productive efficiency from those due to increased market power. Clearly if an *increase* in post-merger profitability is observed, this does not necessarily demonstrate an increase in productive efficiency and management effectiveness. However, (following the arguments of Cowling *et al.*, 1980) if *ex-post* profitability is observed to *decline*, then it is possible to infer that productive efficiency and management effectiveness, *ceteris paribus*, has fallen; the more so when opportunities exist to benefit from increases in market power.

The extent to which negative inferences drawn from these profitability studies are valid clearly depends on how tightly the *ceteris paribus* constraint binds - and this, of course, is unknowable unless the counter-factual can be dealt with adequately. Even so, the sheer weight of evidence is also something to take into account. The balance of that evidence shows clearly that, regardless of country studied, mergers are generally not profit enhancing events, (Mueller, 1980). If accounting profitability is taken to be a valid indicator of productive efficiency and shareholder welfare, then it might be concluded that mergers, on average, lead to both private and social losses.

5. MERGERS AND SHAREHOLDER WEALTH EFFECTS

In this section the aim is to provide an overview of the vast wealth effects literature that has evolved since the mid-1970s. An analysis of technical issues, such as differences between the various studies in terms of event windows, benchmark models, etc., are largely postponed until Chapter 3 and the later chapters that deal with the empirical results.

5.1 From Profitability to Share-Price Research

So far, this review has focussed on research evidence from the domain of industrial economics. But, as mentioned above, since the early 1980s the methods employed by industrial economists have been largely replaced by the event study methods from the field of financial economics, (Caves, 1989). As will be seen below, the evidence from event studies (shareholder wealth effects) has been interpreted as lending clear support to the management displacement hypothesis and the view that mergers are value-enhancing events, (Jensen and Ruback, 1983; Jensen, 1986a). Not surprisingly, therefore, financial economists, particularly those from the US, are highly sceptical of the value of the empirical research from the industrial economics literature, (Bradley, 1987). Indeed in presenting a critique of Caves (1987), Bradley (1987) flatly refutes the negative interpretation placed on the profitability studies in the US. In his view, the industrial economics evidence should be understood as broadly consistent with the evidence from financial economics. There is little doubt that this view would certainly be disputed by Caves (see Caves, 1989) and other by other industrial economists who have also expressed scepticism about the 'scientific evidence' advanced by the financial economics literature, (for example, Mueller, 1989).

While concern here is with merger activity in the UK, in the field of financial economics particular regard has to be given to the evidence from the US. First, this is due to scale of the US literature on event studies compared to that for the UK. Second, there are significant differences between the evidence from the two countries which requires examination.

5.2 The Wealth Effects Approach and the Event Study Method

Issues of research methodology and method are dealt with in detail in Chapter 3. In this section only a broad outline of the event study technology is presented. This technology was first employed by Fama, Fisher, Jensen and Roll (1969) to investigate the impact of share splits on shareholder wealth. Its first application to mergers and acquisitions appears to have been by Mandelker (1974). The essence of the event study method concerns the calculation of *abnormal returns*, contingent on an incremental *information event*. An abnormal return is the difference between the actual return recorded in an 'event window' and an expected or 'benchmark' return. The latter is generated via a benchmark model. This is set out formally below.

$$(1) \quad AR_{i,t} = R_{i,t} - E[R_{i,t}]$$

where: $AR_{i,t}$ = abnormal return on stock i in period t
 $R_{i,t}$ = actual return on stock i in period t
 $E[R_{i,t}]$ = expected return on stock i in period t

A variety of benchmark models have been used, but typically the so-called market model is employed by most studies, (sometimes in conjunction with others).

$$(2) \quad E[R_{i,t}] = \alpha_i + \beta_i R_{m,t}$$

where: $R_{m,t}$ = the return on the stock market market index in period t
 β_i = the measure of systematic risk to be estimated
 α_i = an intercept term to be estimated

The parameters (α_i and β_i) of the benchmark model are estimated over a period (the estimation period) prior to the information event of interest, (for example, the announcement date of a takeover bid). These are then used to calculate the abnormal return, which is averaged across the sample of firms to produce the average abnormal return, AAR_t .

$$(3) \quad AAR_t = \frac{1}{N} \sum_i^N AR_{i,t}$$

The average abnormal returns are then cumulated over the length of the chosen event window, t to T , (for example, a period around the announcement date), to produce the cumulative average abnormal return, $CAAR_T$. The event window is usually drawn longer than the announcement date itself, in order to allow for potential errors in dating the first release of the information.

$$(4) \quad CAAR_T = \sum_t^T AAR_t$$

The cumulative average abnormal return, $CAAR$, is then subjected to a t -test against the null hypothesis of zero abnormal return.

Strictly speaking the Capital Asset Pricing Model (CAPM) would be a more appropriate benchmark, given that it is a theoretically valid equilibrium asset pricing model. However, as

Roll (1977) has pointed out, use of the CAPM suffers from a 'dual-hypothesis' problem, whereby using CAPM to test for market efficiency is handicapped by the assumption of efficiency required in its development. Despite the considerable advances in finance since the advent of CAPM, the dual-hypothesis problem has not been resolved, (Fama, 1991). Some writers have argued that this problem has serious implications for the validity of the empirical results generated by the event study method, Bernard and Thomas (1989), Ball and Kothari (1989). However, Fama (1991) - with perhaps more than a touch of pragmatism - has argued that event studies provide the "cleanest" and the most supportive evidence for stock market efficiency. Given the potential difficulties of the CAPM, many researchers have preferred to adopt an *ad hoc* approach and utilised the market model, which, though lacking theoretical substance, does have the merit of being based on a less restrictive set of assumptions

In the early years of its use the event study method was employed using monthly data, although more recently daily data has been employed in the US, even so, monthly data continues to be the norm in UK studies.

For ease of exposition, the review of the event study research has been divided into three sections: the returns to AD (target) shareholders, the returns to AG (bidder) shareholders, and the net wealth effects of the combined group of AD and AG shareholders. In addition the results for the UK and the USA have also been separated in the case of acquiring firms.

5.3 Returns to Shareholders of Acquired Firms

The first set of results to be dealt with, the returns to the shareholders of AD or target firms does not require a great deal of attention. Almost without exception, the reported returns to this group of shareholders are positive, large and statistically significant. This is evidence on which both industrial and financial economists are agreed in both the US and UK, (Caves, 1987, 1989; Jensen and Ruback, 1983; Jarrell, Brickley and Netter, 1988; Franks and Harris, 1989; Limmack, 1991).

There is some evidence that the scale of the gains to target shareholders has varied over the period from the 1960s to the 1980s, in parallel with variation in the scale of takeover premiums paid by acquirers, (Jarrell, Brickley and Netter, 1988; Bradley Desai and Kim, 1988). There is

also evidence to suggest that shareholders of targets in cross-border transactions earn even higher returns than those in domestic takeovers, (Harris and Ravenscraft, 1989).

The average size of target firms appears to have increased over time, Bradley, Desai and Kim (1988). This is a potentially important finding when contrasted with the earlier financial characteristics evidence, which suggested that size has been potentially a strong defence against takeover, (Singh, 1971, 1975; Levine and Aaronovitch, 1981).

In recent years researchers have focused on 'hostile' and 'contested' takeover bids as being potentially different in character from so-called 'friendly' bids and mergers. Morck, Shliefer and Vishny (1988) provide evidence to suggest that firms which are the targets of hostile bids are characterised by low growth and investment. They also have low Tobin's Q and are more likely to attract a hostile bid because of inefficient management, rather than for synergistic benefits. But this contrasts with the work of Herman and Lowenstein (1987), and Pound (1985) who both found no significant difference between the two groups of firms. However, when it comes to target shareholder returns, Browne and Rosengren (1987) produce US results which show significantly increased gains where an incumbent management contests a bid. A result supported by the US results from Huang and Walking (1987), and the UK results from Franks and Harris (1989).¹³

5.4 Returns to Shareholders of Acquiring Firms in the UK

In contrast to this consensus about the wealth effects for shareholders of target firms, the sign and size of abnormal returns to shareholders of acquiring firms are the subject of considerable doubt and contradictory research evidence, (Frank, Harris and Titman, 1991).

The evidence on wealth effects from UK event studies is rather inconsistent, (Limmack, 1991). Some studies show that bidder shareholders make gains around the time of bid announcement, but most show that bidders experience negative returns which are insignificantly different from

¹³ There is a problem in defining hostile bids. Many researchers rely on rejection by the incumbent management team of the target as a proxy for hostility, but it is conceivable that initial rejection is no more than an attempt to increase the control premium offered by the bidder.

zero. However, in the longer term (anything from 10 months to 5 years after the merger) cumulative losses which wipe out any earlier gains have been widely reported. The results of the various studies are examined in some detail below.

To begin with the examination focusses on bidder returns centred around the bid announcement. In the first event study research in the UK, Franks, Broyles and Hecht (1977) examined 74 industry specific acquisitions over the period 1955-72 and reported positive and statistically significant returns to bidders. Positive returns were also reported by Dodds and Quek (1985), for 70 successful bidders over the period 1974-76, and with a sample of more than 1000 bidders, over the period 1955-85, Franks and Harris (1989) also report gains of around one per cent in the announcement month, and even larger gains when the event window was extended to months -4 to +1. However, all these gains were not significantly different from zero.

This finding of announcement returns insignificantly different from zero has been reported in a substantial number of the UK studies. For a sample of 39 bidders over the period 1974-76, Barnes (1978) reported a return of zero, as did Firth (1979, 1980) for 224 bidders over the period 1969-75. Limmack (1991) reports similar results for his 1977-86 sample of over 500 bidders when the returns were calculated on an equally-weighted basis, but negative returns that were statistically significant on a value-weighted basis. This suggests that, in the UK, larger acquiring firms on average experience poorer performance than their smaller counterparts. Interestingly perhaps, the poorer announcement returns to larger bidders reported by Limmack is consistent with the value-weighted results from Franks and Harris (1989), even though the latter reported gains rather than losses.

There is a recent study which stands in sharp contrast to the results from earlier studies. In a large scale study of 429 acquisitions, completed during 1980-90, Sudarsanam *et al.* (1996) report negative returns to acquirers for three alternative event windows drawn around bid announcement. These losses range from -1.26 per cent to -4.04 per cent and were statistically significant at the one per cent level.

Unlike the announcement period wealth effects, the evidence on post-completion returns to

bidders generally show that bidders suffer (often substantial) losses, (for example, Barnes, 1984; Firth, 1980; Limmack, 1991; Kennedy and Limmack, 1996; Gregory, 1997). Despite the balance of the evidence, there are a small number of studies that point to positive returns in some periods and for some benchmarks, (Franks and Harris, 1989; Higson and Elliott, 1998).

Even in studies where bidders were reported as making announcement period gains, the post-completion experience is negative. The announcement period gains reported by Franks *et al.* (1977) are reversed and eliminated in the post outcome period. A reversal in the fortunes of bidders is also reported by Dodds and Quek (1985), although the reverse does not occur until 2 years after completion. This is also the case for the much larger study by Franks and Harris (1989), although this is only the case for abnormal returns generated by the market model benchmark. When the CAPM and the adjusted market model ($\alpha=0$, $\beta=1$) benchmarks are used, both show positive gains of around 4 per cent.

This inconsistency in the results generated by different benchmarks is also a feature of the study by Limmack (1991). Although bidders suffer losses on an equally-weighted basis according to each of the three benchmarks that he used, they are only statistically significant in the case of the market model. This changes somewhat when the abnormal returns are calculated on a value-weighted basis, with significant losses reported for both the market model and the index model (adjusted market model). Despite some sensitivity to the model used and the way in which abnormal returns were calculated, Limmack concludes that bidders do suffer post-outcome losses and that these are due to the gains made by the shareholders of target firms.

There have been two UK studies devoted specifically to the issue of post-completion returns to bidders,¹⁴ which have attempted to resolve the inconsistencies for this event window reported by various UK studies, (Higson and Elliott, 1998; Gregory, 1997).

Higson and Elliott (1998) examined a sample of 776 acquiring firms over the period 1974-1990.

¹⁴ The negative post-completion returns to bidders is a widely acknowledged finding, even when positive announcement period returns have been reported. As Jensen and Ruback (1983) acknowledge in their review, this result has been considered particularly *unsettling* by many researchers.

Using a size-adjusted benchmark, and reporting 'holding period returns' rather than the conventional CAARs, their results for the full period show that bidders made statistically insignificant losses of -1.14 per cent. This result was reasonably robust to a number of modifications in their testing procedures. However, their results were sensitive to the period(s) tested. In particular, the gains that acquirers made during the period 1981-84, (some 20 per cent of their sample), served to outweigh the statistically significant losses that acquirers suffered during the periods 1974-80 and 1985-90.

Gregory (1997) examined a sample in excess of 400 acquiring firms over the period 1984-92. He was also concerned to deal with a number of methodological problems that had been identified in the literature and so used a total of 5 benchmark models. Regardless of the benchmark applied, his results show that acquirers, on average, suffered statistically significant losses. These losses seemed to have been exacerbated in the cases of diversifying mergers, recommended bids, and those financed by an exchange of shares, rather than cash. His findings are summarised in the following way, Gregory, (1997: 1001):

"... the main conclusion from this analysis is that the long-run post acquisition performance of UK acquiring firms is significantly negative, and that this result is robust to alternative benchmark specifications."

Although the event study methodology is now dominant, alternative approaches have been used to measure shareholder wealth effects of mergers. Sturges and Wheale (1984) and Cosh, Hughes and Singh (1980) compare AG shareholder returns with industry matched, non-acquiring comparators. Results from the first study were inconclusive, while the findings from the latter are consistent with the majority of UK studies, with a decline in post-merger bidder returns.

In summary, the weight of the empirical evidence for the UK suggests that wealth effects for bidder shareholders are broadly neutral around announcement, but tend to deteriorate substantially post-completion.

Despite certain inconsistencies in the results for announcement period returns, it could be argued that these are consistent with a perfectly competitive market for corporate control. In such a

market the premium required to achieve control means that acquisitions represent zero net present value projects for acquirers, i.e. that they meet their shareholders' required rate of return, but no more. Of course, the post-merger results suggest the opposite. Against this, it has been argued that a number of statistical and measurement problems cast serious doubt on the validity of post-merger returns, and that they should not be relied on, (Jensen and Ruback, 1983; Franks and Harris, 1989). However, the negative post-merger returns do, on the other hand, represent one of the more consistent features of the UK results. Furthermore, it is not clear why, if synergistic gains are only possible via merger, all those gains should be captured by target shareholders. Given the inconsistencies in the empirical evidence, however, it is difficult to reach any firm conclusions.

5.5 Returns to Shareholders of Acquiring Firms in the US

Examination of the US evidence is helped considerably by reference to two authoritative reviews of the 'scientific evidence' by Jensen and Ruback (1983) and Jarrell, Brickley and Netter (1988).

From 20 studies reviewed, Jensen and Ruback (1983) calculate positive abnormal returns of around 4 per cent to bidders in successful tender offers and around zero for mergers. They conclude their review with the following words:

"In brief, the evidence seems to indicate that corporate takeovers generate positive gains, that target firm shareholders benefit, and that bidding firm shareholders do not lose. Moreover, the gains created by corporate takeovers do not appear to come from the creation of market power." (Jensen and Ruback, 1983:47)

The final sentence from this quotation is particularly interesting when earlier on the same page they admit: "Finally, knowledge of the sources of takeover gains still eludes us."

The clear inferences and strong conclusions that Jensen and Ruback draw from their reading of the evidence has been questioned by a number of industrial economists, (Scherer, 1988; Caves 1989). While few would dispute the stylised fact that in the US, as in the UK, target shareholders make gains from both mergers and tender offers, (on average between 19-35 per cent according to Jarrell, Brickley and Netter, 1988), the returns to bidder shareholders have been acknowledged

to be a matter of some doubt, even in the financial economics literature, (Roll, 1987).

Such doubts can even be demonstrated by studies reviewed by Jensen and Ruback (1983). While announcement period returns are generally positive for tender offers, the results for mergers are much less consistent. In contrast, the post-outcome abnormal returns to bidders average a negative 5.5 per cent, (with only one positive, but statistically insignificant finding from the total of seven studies with post-merger results reviewed). Jensen and Ruback (1983:20) summarise these problematic findings in the following way:

"Several studies show indications of systematic reductions in the stock prices of bidding firms in the year following the event. These post-outcome negative abnormal returns are unsettling because they are inconsistent with market efficiency and suggest that changes in stock price during take-overs overestimate the future efficiency gains from mergers."

Jensen and Ruback attribute these 'unsettling' results to causes that have to do with measurement problems and sample selection bias. As in the UK, a number of recent US studies have set out to examine this specific issue.

Franks, Harris and Titman (1991) examined 399 takeovers during the period 1975-84 and, employing multi-factor benchmarks adjusting for characteristics such as size and dividend yield, they found no evidence of statistically significant abnormal performance in the post-completion period. This contrasts with their findings for the conventional benchmarks, which produced negative returns on an equally-weighted basis and positive returns for a value-weighted benchmark.¹⁵

Their findings receive support from a small sample study by Healy, Palepu and Ruback (1992). They examined the post-completion performance of the 50 largest US acquisitions in the period 1979-84, and found performance improvements, particularly in cases when bidders and targets had 'highly overlapping' lines of business. They also discovered a strong positive relationship between improvements in post-completion cash flow performance and the positive abnormal

¹⁵ These findings about a size effect are not replicated in the UK study by Gregory (1997).

returns experienced by these firms at announcement.

However, in a much larger, 'exhaustive' sample of 1,164 acquisitions for the period 1955-87, Agrawal, Jaffe and Mandelker (1992) report a statistically significant loss of 10 per cent for acquiring firms.

The later review article by Jarrell, Brickley and Netter (1988) is particularly interesting for the present study because it shows a secular decline in the returns to bidder shareholders over time. On the basis of their review they demonstrate that in the 1960s bidders had a positive and significant CAARs of 4-5 per cent. During the 1970s this declined to a positive and significant mean of about 2 per cent, but statistically insignificant one per cent. The returns referred to here are for the period around announcement, the only returns quoted, and it would have been even more interesting to have been given the post-outcome returns as in Jensen and Ruback (1983).

This decline over time in the mean returns to bidders is confirmed by Bradley, Desai and Kim (1988). From their data they report the mean bidder return in the 1960s as a positive 4 per cent; in the 1970s it drops to 1.3 per cent and by the 1980s it has become a loss of 3 per cent: the results for the 1960s and 1980s were significant at the 1 per cent level. In contrast to the picture provided by these period-segmented results, Bradley *et al* show bidder returns for the whole period of their study to be positive and significant. A result confirmed by the results for a very similar time period reviewed by Jarrell *et al* (1988).

The cross-sectional distribution of returns has also been examined by You *et al* (1986). They analysed 133 merger returns during the period 1975-84. Their mean target return was 20 per cent, but they found that 20 per cent of targets had returns greater than 40 per cent, but 18 per cent actually had negative returns. This pattern was replicated for bidders. The mean return was a negative one per cent, but 53 per cent of bidders had negative returns of over 5 per cent.

The putative wealth creation and economy-wide gains attributed to mergers and acquisitions by Jensen and Ruback (1983) are called into question when the dollar gains and losses to targets and bidders have been aggregated. Bradley, Desai and Kim (1988) examined the combined dollar

wealth effects and reported a weighted average gain of 7.4 per cent overall. However, in 25 per cent of their sample combined dollar losses were suffered, and in only 47 per cent of cases did acquiring firms make dollar gains.

This finding suggests that if stock market reaction to bid announcement and completion is an accurate reflection of the NPV consequences of an acquisition, then management teams of bidders seem equally likely to make good and bad decisions. This observation is consistent with free cash flow theory, (Jensen, 1986b), which suggests that mergers and acquisitions can be a symptom of principal-agent problems, as well as a potential cure. Jensen (1986b) reports on the record of US oil firms during the 1980s to demonstrate this. In an analysis of 326 acquisitions over the period 1975-87, Morck, Shliefer and Vishny (1990) also concluded that managerial objectives play a part in explaining losses to acquiring firms, particularly when the acquirer attempts to diversify, acquire a high growth target, or when a bidder's own performance has been poor prior to an acquisition. Other studies have also provided evidence to support the free cash flow theory, (Lang, Stulz and Walkling, 1991; Trahan, 1994).

This sort of evidence suggests that the unequivocal claims by Jensen and Ruback (1983), that mergers and acquisitions are value-enhancing events, which bring benefits to the US economy, should be treated with some caution. The more so if the *threat* of takeover causes the managements of soundly performing firms to undertake unnecessary and expensive defensive actions, which also have potential hazards for their future performance, (Weston and Chen, 1994). And also if bidding managers fail to learn from their own past errors and those of others, (Lubatkin, 1996).

5.6 Factors influencing Wealth Effects

A number of factors have the potential to influence both the motivations that lie behind mergers and acquisitions, and the sources of any gains or losses that might result, (Jensen, 1987; Roll, 1987; Ravenscraft, 1988). Some wealth effects studies have not controlled for these factors, whilst others have done so, and this could account for the differences in the results reviewed in sections 5.4 and 5.5 above. Some of these issues will be discussed briefly below.

5.6.1 Management Shareholdings

Given the potential for conflict between the objectives of managers and shareholders, (Jensen and Meckling, 1976; Jensen, 1986b), it seems plausible to suggest that the proportion of stock owned by the bidder management team might have an impact on the returns to bidder shareholders. A number of US studies have confirmed such an influence.

From their sample, You *et al* (1986) provide results which show that the total wealth impact on bidders is positively related to the proportion of stock owned by the management. This finding is supported by the study of pre-merger share transactions of bidder managements by Seyhun (1990). He concludes that managers of a bidding firm are more likely to acquire stock in their firm when the wealth outcome of a subsequent acquisition is positive.

5.6.2 Merger Gains from Increased Market Power

One obvious source of gain from horizontal and vertical merger is the accretion of market power. Indeed, Scott (1989) argues that conglomerate mergers might also bring market power benefits, although earlier, this possibility had been dismissed by Roll (1987). Despite the theoretical arguments, the results from Eckbo (1983) and Stillman (1983) have been utilised by Jensen (1987), among others, as evidence against market power as the source of gains in takeovers.

The study by Eckbo (1983) represents an indirect test, (criticised on methodological grounds by Ravenscraft, 1988), of the market power hypothesis. The test is predicated on the assumption that a horizontal merger would reduce 'the costs of enforcing a tacit collusive agreement within the industry of the merging firms', (Eckbo, 1983: 269). Thus Eckbo focusses on the abnormal returns response to rivals of a horizontal bidder where a proposed merger was challenged by the US competition authorities. For 65 horizontal merger announcements prior to a regulatory challenge, (during the period 1963-78), rivals earned positive returns of 2.45 per cent, suggesting evidence in favour of the collusion hypothesis. However, when the subsequent challenge was announced, the rivals also made significant gains of 1.78 per cent, which contradicts it. Eckbo also finds that bidders and targets in challenged mergers earn larger gains than those in unchallenged mergers, from which he infers that such mergers have more potential for market power benefits. Stillman (1983) conducts a similar exercise, with similarly inconclusive results. As Ruback (1987) points

out, apart from these studies by Eckbo and Stillman, there is very little direct evidence against the market power hypothesis, and so whether increased market power is a source of merger gains remains an open question.

5.6.3 The Medium of Exchange

Evidence that differences in the medium of exchange can influence abnormal returns has been provided by Franks, Harris and Mayer (1988). Their results for the US show that, on average, bidders suffer an average loss of 2 per cent at announcement when a take-over is funded with equity, and that further losses are incurred for a period of two years post-merger. In contrast, a positive and significant 2 per cent return is recorded, with no negative post-merger returns, when a takeover is financed by cash. Their UK results for equity and cash bidders are insignificantly different from zero, but this might be the consequence of UK practice whereby an equity bid is usually provided with a cash alternative. The results from Franks *et al.* confirm earlier work on this issue by Asquith, Bruner and Mullins (1987) and Travlos (1987). Both these studies found positive returns to bidders in all-cash offers and negative returns in the case of all-equity transactions.

These results are consistent with two explanations. First, that bidders offer equity when they believe that their stock is overvalued: an expectation that is not fulfilled. And second, as Franks, Harris and Titman (1991) suggest, they are consistent with the free cash flow theory of Jensen (1986b). The market responds favourably to an all-cash bid because it is perceived as a positive reduction in managerial discretion over free cash flow. The converse applies with an all-equity bid.

There are also potential tax implications to account for when considering the medium of exchange. First, payment in cash will lead to an earlier charge for capital gains tax, suggesting that the bid premium would have to be increased to take this into account, (Travlos,1987). However, off-setting this negative tax effect, the use of cash (and only cash) would allow the acquirer to mark up the depreciable basis of acquired assets thus reducing its corporate tax charge. The impact of taxes on the putative 'medium of exchange effect' is largely an empirical matter and is examined next.

5.6.4 The Effect of Taxation on Mergers Transactions

Auerbach and Reishus (1987) suggest three ways in which taxes might provide the motivation for merger activity and impact on the resultant returns. First, one of the firms involved in a merger might have tax credits which it is not in a position to use itself, but which could be used by its merger partner. Second, a post-merger combination might be able to mark up the depreciable basis of its assets, thereby reducing its tax burden. And third, the merger might influence the debt structure of the combined firm, increasing the tax shield.

Auerbach and Reishus (1987) investigated 318 mergers during the period 1968-83 in a search for these potential gains from taxes. They found that gains from marking up the depreciable basis of assets were negligible, although they admit to problems with the data in this part of their study. They also found zero gains from tax shields due to interest charges. In contrast their results did confirm gains from the use of tax losses, but only in 6.5% of their sample, accounting for, on average, 10.5 per cent of the value of the takeovers in question.

Gilson, Scholes and Wolfson (1987) argue that corporate tax effects do not account for the whole of the potential tax gains and losses that arise in mergers and acquisitions. They point to the impact on personal taxation of merger transactions which should also be taken into account. They also cast doubt, confirmed by Ruback (1987), on the apparent incremental tax effects, which *prima facie* appear to arise from merger transactions, but which could be brought about by means other than mergers.

In view of the evidence from Auerbach and Reishus (1987) and the arguments of Gilson *et al* (1987) and Ruback (1987), it would appear that taxes account for a very small proportion of the total gains/losses which accrue to US shareholders as a result of merger activity.

In the UK context, King (1986) has suggested a model whereby incentives for mergers and acquisitions arise due to the extra tax burden on corporate profits, as opposed to personal taxes. However, as Franks and Harris (1993) point out, the power of such incentives depends on a substantial gap between the two forms of taxation. Following tax changes that gap was reduced throughout the 1980s thereby reducing any tax incentives for mergers.

5.6.5 Financial Leverage and Merging Firms

The under-use of debt capacity on the part of management has been suggested by Jensen (1986b) as a possible manifestation of a principal-agent problems. The failure on the part of management to 'disgorge' free cash flows to shareholders, signals a failure to maximise shareholder wealth. *Ceteris paribus*, it might be expected, therefore, that target firms display a lower gearing ratio compared to the industry average and bidder firms. Although Jensen (1986b) focusses on the misuse of free cash flows by bidders, rather than targets, an inadequate use of leverage by target firms might nevertheless signal opportunities for bidders.

This is indeed confirmed by a number of studies, for example, (Mueller, 1980; Palepu, 1985; Bartley and Boardman, 1986). However, the extent to which the acquisition of such firms leads to wealth gains for bidder shareholders is rather more doubtful. You *et al* (1986) found no significant correlation between wealth effects and the differences in leverage between targets and bidders. Furthermore, Wakeman and Stewart (1987) found that differences in leverage between target and bidder had significant negative wealth effects for bidder shareholders.

One way in which financial leverage has had a major impact on take-over activity is in cases where the use of innovative debt instruments such as 'junk bonds' and 'mezzanine finance' have been used to finance so-called leveraged buyouts. Certainly the use of these techniques has made sheer size a less adequate defence against hostile take-over bids than was the case formerly, (Jarrell, 1988). Indeed, Jensen (1987) has argued that, in the US, the restrictions on the use of debt in financing take-overs, introduced by the Federal Reserve Board in 1986, are likely to work against the interests of shareholders.

Despite the theoretical framework offered by the free cash flow theory, the impact of leverage still seems to be an empirical and unanswered question.

5.6.6 Growth and Business Match

Based on various managerial theories of the firm, (Baumol, 1967; Williamson, 1963; Marris, 1964), and principal-agent theory, (Jensen and Meckling, 1976), a number of hypotheses have been developed which suggest that managers might pursue growth and diversification objectives

at the expense of profitability. These hypotheses have been the subject of considerable attention in the literature on managerial compensation, (for example, Murphy, 1985), but they have also been the subject of investigation in the mergers literature.

Ravenscraft and Scherer (1987a), examining US industry growth characteristics for the period 1950-75, found that industry growth was a statistically significant determinant of the distribution of merger activity throughout the economy. They also produced evidence to show that bidders deliberately sought targets in industries with a better record of growth than their own, with subsequently adverse impacts post-merger.

However, as Ravenscraft (1988) points out, the US evidence at the level of the firm, (even when diversification is not involved), is rather more confused. On the one hand Palepu (1985) finds target firms tend to be slow growers, whereas the studies of both Wansley, Roenfeldt and Cooley (1983) and Herman and Lowenstein (1987) produced results which show targets as high growth companies. In between, the results from Harris *et al* (1982) and Mueller (1980) suggest that targets are average performers in terms of growth.

In the UK there is some evidence that targets have below average growth rates, (Kuehn, 1975; Cosh, Hughes and Singh, 1980; Levine and Aaronovitch, 1981). However, in a more recent sample of 429 UK acquisitions used by Sudarsanam *et al.* (1996), targets' growth rate exceeded bidders' by 34.5 per cent.

Although no general conclusion can be drawn about whether targets are typically high growth or low growth firms, there is evidence to suggest that acquirers which attempt to 'buy' growth via acquisition suffer wealth losses as a result. In their study of 326 US acquisitions between 1975 and 1987, Morck *et al.* (1990) produce clear evidence that bidders suffer systematically negative returns when they acquired a high growth target.

The relatedness of the lines of business of bidder and target also has potential implications for shareholder wealth effects. Modern portfolio theory would suggest that it is unlikely that shareholders would value diversifying mergers, given that they can achieve the benefits of

diversification on their own account. Indeed, Amihud and Lev (1981) suggest that, to the extent that diversifying mergers can reduce the variance of a firm's earnings and thus its total risk, they will benefit managers.

Despite these arguments, the evidence on the impact of relatedness on shareholder wealth has been rather mixed. In the US, Sicherman and Pettway (1987) examined the acquisition of spin-off firms and found negative, though insignificant bidder returns in unrelated transactions, as against positive and significant bidder returns in related cases. Again in the US, Scanlon, Trifts and Pettway (1989) found related acquirers made gains of 2.26 per cent, but that unrelated acquirers suffered losses of 1.94 per cent. Although neither results were statistically significant, the difference between them of 4.20 per cent was significant at the one per cent level. Finally, Morck, Shliefer and Vishny (1990) also provide evidence that returns to bidder shareholders are lower in diversifying mergers, although their results depended to some extent on the date of acquisition.

In contrast, and counter to the intuition drawn from modern finance theory, other US studies have found that unrelated or conglomerate mergers have delivered better returns to bidder shareholders than related mergers, (Elgers and Clark, 1980; Lubatkin, 1987). There is also evidence that post-completion performance of unrelated mergers is better than that of related cases, (Kusseyitt, 1985). One explanation that has been offered for the inconsistent results regarding the relatedness hypothesis comes from Barney (1988), who suggests that relatedness is an insufficient condition to ensure better returns. In addition, acquiring firms must have one or more of three other conditions: private and unique synergies with the target; inimitable synergies with the target; or unexpected synergies, (which could obviously not influence announcement period returns).

In the UK Sudarsanam *et al.* (1996) found weak evidence in favour of the relatedness hypothesis as an explanator of bidder returns. The results from Limmack (1990) show horizontal acquirers outperforming both vertical and conglomerate acquirers for the period 1977-80, but the reverse in 1981-86. However, the differences between the three types of merger were not statistically significant. In a similar vein, Limmack and McGregor (1995) were also unable to support the

relatedness hypothesis.

Despite the rather mixed evidence from both the US and the UK, since the conglomerate boom of the 1960s and 1970s, there appears to have been a period of strategic re-alignment, during the 1980s. Many firms have divested themselves of peripheral activities and returned to so-called core businesses, (Browne and Rosengren, 1987; Jensen, 1987; Shliefer and Vishny, 1991), a recognition by corporate strategists perhaps that diversification is not an appropriate means for maximising shareholder wealth.

5.7 Conclusions from the Wealth Effects Studies

A succinct summary of the empirical evidence from wealth effect studies on mergers is provided by Roll (1987:241-2):

"Virtually *every* empirical study has found that target firms display statistically significant positive price response to the announcement of a takeover attempt. ... [however] empirical results for bidding firms permit a variety of interpretations."

This perspective is more cautious than the conclusions drawn by other financial economists, (Jensen and Ruback, 1983; Jarrell, Brickley and Netter, 1988; Franks and Harris, 1989), who view the evidence as sufficiently robust and consistent to regard mergers and acquisitions as both value-enhancing and economically efficient. However, Roll's caution would tend to find favour among industrial economists, (Caves, 1989; Mueller, 1989).

Evidence for the lack of consistency between the results for bidders is plentiful. Examples of positive returns include the work by Bradley (1980), Asquith (1983) and Dennis and McConnell (1986). Examples of negative findings are provided by Dodd (1980), Firth (1980), Eger (1983). Other studies have provided a mix of results for bidders, and include Malatesta (1983) and Franks and Harris (1989) who find both positive and negative returns depending on method and benchmark applied. In fact the issue of test specification can be crucial to the results obtained, as shown by the results from Dennis and McConnell (1986), Maggenheim and Mueller (1987), and Bradley and Jarrell (1987). Sometimes simple and apparently minor modifications to the event study test specifications, such as changes in the length of event window, can transform the

results obtained, even with the same data set.

5.7.1 Difficulties of Interpretation

As Roll (1987) points out, the results from event studies have differed markedly with respect to methodology, time periods, data samples, etc. These differences in turn make it very difficult to draw definitive conclusions from the empirical work. Therefore drawing valid inferences about either the efficiency of the market for corporate control, or about policy prescriptions is equally difficult. However, only the returns to bidding firms are in doubt. Despite the differences in methodology, data and time periods examined, one result of the wealth effects literature is clear and accepted: shareholders of target firms gain significantly.

The issue about data having been drawn from different time periods is also emphasised by Ravenscraft (1988). He argues that the very different economic and political climates that have existed since the 1960s are likely to have had a significant impact on the underlying causes which stimulate changes in the overall level of merger activity. Therefore the motivations driving individual transactions in different eras might well diverge.

Yet another problem of interpretation has been suggested by Roll (1987). He argues that the evidence for target firms shows that they earn large abnormal returns in the period immediately surrounding the bid announcement. This can be interpreted as an apparent demonstration of 'surprise' on the part of investors, and therefore points to a largely 'passive' role for targets. In contrast, as initiators of the bid, bidders are clearly 'active'. As such, Roll suggests, the bid announcement may convey not only information about the likely outcome of the bid and subsequent takeover, but also new information about the bidder firm itself. For example, that the bidder has sufficient cash to make the bid, that it has sufficient managerial resources to make the bid, and so on. If the announcement does indeed contain this sort of information, as Roll suggests, then it should be expected that the market will react to it and discount the bidder's share price accordingly. Roll's point is that the bid announcement could therefore be regarded as contaminated information, leading to inaccurate measures of the specific abnormal returns which are typically used to calculate gains and losses arising from merger activity.

The negative post-merger returns to successful bidders which have been such a consistent feature of the literature, (Langetieg, 1978; Asquith, 1983; Malatesta, 1983; Maggenheim and Mueller, 1987; Franks, Harris and Mayer, 1988; Franks and Harris, 1989; Limmack, 1991), have already been alluded to. These results clearly present difficulties when attempting to interpret positive findings at announcement, and have been acknowledged to be inconsistent with an efficient markets framework, (Jensen and Ruback, 1983).

Industrial economists, (Caves, 1989; Mueller, 1989; Ravenscraft, 1988), tend to interpret such results as evidence of inefficiency in the market for corporate control. But, despite the inconsistency of the evidence with an efficient market, most financial economists, (with a notable exception in Roll, 1987), would tend to follow the view put forward by Jensen and Ruback (1983), who argue that the problems lie with sample selection bias and estimation errors.

However, at the time of announcement the final outcome of a bid is uncertain. The share-price reaction at announcement can be expected, therefore, to incorporate market expectations about the benefits to be derived from a successful takeover, but also the likelihood of bid success, the likelihood of the entry of rival bidders, target resistance, increases in the premium to be paid, etc. This suggests that a more appropriate event window to account for this would be the period from announcement to outcome, which would account for information about these factors as it is revealed in the bid process. (Surprisingly few studies focus on this window, an omission that the present study will take up.) When the outcome of a bid has been decided, it seems reasonable to suggest, particularly given that many acquisitions represent sizeable investments, that in the immediate aftermath and for some time afterwards any further market response is likely to be connected to the acquirer's efforts to integrate the acquired assets. Thus, in an efficient market, any post-merger drift in share price returns is, in theory, likely to represent market expectations about the future prospects for the combined firm. Unfortunately, as seen in Section 5, the literature that deals specifically with the issue of post-merger drift is less than convincing, (Franks, Harris and Titman, 1991; Agrawal, Jaffe and Mandelker, 1992; Higson and Elliott, 1998; Gregory, 1997).

5.7.2 Combined Wealth Outcomes of Mergers

Doubt about the size and sign of bidder returns and the stylised fact that acquiring firms are considerably larger than target firms, together cast doubt on the extent to which mergers and acquisitions are likely to generate positive combined or joint wealth effects to shareholders. However, there is surprisingly little direct evidence on this joint wealth measure.

Dennis and McConnell (1986) report combined dollar gains for target and bidder shareholders. However, Roll (1987) has criticised this study by pointing out that bidder losses would have been recorded if they had followed the usual convention of focussing the event window more narrowly around the bid announcement. Earlier, Malatesta (1983) reported negative returns in dollar terms to shareholders of bidding firms, and doubt about overall cash gains, is also reinforced by Bradley, Desai and Kim (1983) who report dollar losses for 25 of target and bidder combinations in their sample, as well as dollar losses for 53 per cent of bidders.

5.7.3 Judging Takeover Efficiency by the Incidence of Subsequent Divestment

Some writers have argued that the empirical evidence on the subsequent divestiture of earlier acquisitions can, indirectly, shed light on the extent to which mergers and acquisitions might be regarded as economically worthwhile, (Caves, 1987, 1989; Porter, 1987; Scherer, 1988). In contrast Bradley (1987: 171) has described using divestitures for ‘...gaining insights into the nature of corporate acquisitions [as] like trying to understand the institution of marriage by interviewing only divorced couples.’ Furthermore, as Caves (1987) makes clear, divestment of a previous acquisition does not necessarily signal an ‘unprofitable’ acquisition. It may be that the acquirer has achieved the necessary and available improvement in the acquired firm’s performance and simply wishes to realise the reward of that improvement.

This last point is, of course, an empirical question. However, at least some of the evidence on pre-merger target profitability (Singh, 1975; Levine and Aaronovitch, 1981; Ravenscraft and Scherer, 1987; Palepu, 1986; Matsusaka 1993) suggests that opportunities of once-and-for-all profit improvements of this kind might well be scarce and unlikely to explain the full extent of divestiture. Added weight is given to this argument when account is taken of the scale of divestiture. For example, according to Grimm (1987), divestiture was running at over 50 per cent of US acquisitions undertaken 1975-6, and fluctuated between 35-40 per cent during the 1980s.

The easing of the regulatory environment in the USA during the 1980s might help to account for the high incidence of divestiture. The more relaxed policy stance about horizontal acquisitions could have provided incentives to conglomerate firms to sell assets to an acquirer in a related line of business, because of an increased premium that those related assets attract. Thus a profitable opportunity exists that would have been subject to regulatory challenge in an earlier era.

Kaplan and Weisbach (1992) trace the progress of a sample of 271 large acquisitions completed during the period 1971-82. They discovered that by 1989 some 44 per cent had been subsequently divested. Of these, conglomerate acquisitions were four times as likely to have been divested as related acquisitions, even though they were not necessarily less profitable. Kaplan and Weisbach suggest that of the divested acquisitions, between 34-50 per cent could be regarded as unsuccessful. However, they did find evidence to suggest that, at the time of the bid announcement, subsequent failure was correctly anticipated by the market, reflected by negative abnormal returns to acquirers. Kaplan and Weisbach also suggest that this might be regarded as evidence for the existence of hubris: that is, the management of bidder firms who had observed their share prices marked down by the market, nevertheless pursued the bid to completion. Support for these findings is also presented by Allen *et al* (1995) in their study of 94 US spin-offs following acquisition during the period 1962-91. The results show that the larger the wealth loss at the time of the original acquisition, the larger the wealth gain at subsequent spin-off.

In a recent UK study, Lasfer, Sudarsanam and Taffler (1992) provide evidence that the returns to divestiture can be influenced by the financial health of the seller. Divestments by firms that were in some financial distress yielded larger returns than firms that were financially sound. They interpret this result to mean that the market not only takes account of the intrinsic value of the divestment, but also values the relief of bankruptcy costs.

Linn and Rozeff (1984) argue that there are only two reasons for divestiture: (a) the assets are worth more to the buyer than the seller; (b) the assets have an adverse impact on the productivity of other assets. Thus, those who rely on the rate of divestment as an indication of the failure of previous acquisitions make an implicit assumption that the latter predominates, but this need not be the case. If changes in the US regulatory environment provided an opportunity to divest assets

to a bidder in the same line of business, which would have been blocked prior to the changes, then divestment would not necessarily be indicative of a failure in the original acquisition. Acquisition followed by divestment is another interesting facet of the overall mergers and acquisitions phenomenon. However the extent to which it sheds further light is open to question.

6. MANAGERIAL INTERESTS

Jensen (1986a, 1987), following the theoretical foundations laid by Manne (1965) and Fama (1980), has characterised the market for corporate control as the site where rival teams of corporate managers compete for control of corporate assets. If this characterisation of the takeover market is accurate, then at least some of the evidence suggests that it would be worthwhile considering managerial motives and incentives for mergers and acquisitions. For example, the evidence from Bradley *et al* (1983), that, bidders suffer cash losses in over 50 per cent of cases seems, at face value, to be at odds with an objective of shareholder wealth maximisation.

In contrast, financial economists have tended to argue that the empirical evidence points to mergers and acquisitions as value-enhancing events. Additional shareholder value is created by displacing inefficient management teams and by the realisation of unspecified 'synergies', (Jensen and Ruback, 1983; Jensen, 1986a, 1987, 1988; Jarrell *et al.*, 1988). Whilst substantial gains to target shareholders are reported in every event study, the evidence on returns to bidder shareholders, as seen above, is not as clear cut, (in the UK, Firth, 1979, 1980; Franks and Harris, 1989; Barnes, 1984; Dodds and Quek, 1985; Limmack, 1991; Sudarsanam *et al.*, 1996).

In a competitive acquisitions market, managers of successful bidders could only expect to make normal returns from takeover investments. Therefore, studies which show that bidders earn zero abnormal returns have been taken as indicative of a competitive market.¹⁶ But, given the scale of evidence for negative returns to bidders, it could be argued that acquisitions are riskier than

¹⁶ In the US, Jensen (1987) has argued that developments in federal and state regulation during the 1980s, as well as anti-takeover charter amendments, have increased the bargaining power of target managements. This, in turn, has ensured that bidders will have to pay the full value of merger benefits to target shareholders.

organic investment opportunities; indeed there is US evidence to support that contention, (McConnell and Mucarella, 1985). So, if acquisitions are riskier investments, then bidder managements should only be prepared to launch a bid if they are able to offer their shareholders at least the prospect of positive returns. In other words, to be working for the interests of shareholders, acquisitions have to offer considerably better odds of up-side potential, to compensate for the extent of down-side risk. Furthermore, if disciplinary or synergistic gains depend on the input of the acquirer, then it is not at all clear why all the gains should accrue to the target.

Much of the evidence suggests that many corporate management teams and their advisers adopt acquisition strategies that offer little prospect of a positive outcome. Indeed, in a recent UK survey, over 50 per cent of senior executives who had undertaken acquisitions deemed them to have been failures, (Coopers & Lybrand, 1993). If this finding can be applied to the population of acquirers, it seems appropriate to ask why such mistakes occur? The next three sections will analyse the evidence on the disciplinary role of takeovers, management motives and incentives, including the management compensation literature.

6.1 Does the Market Discipline Work?

The essence of the disciplinary hypothesis is that efficient management teams displace the less efficient. Whilst results from the standard event studies produce evidence that is both consistent and inconsistent with the disciplinary hypothesis, they do not provide a *direct* test. However, a recent extension of the event study literature has sought to provide a direct test by examining pre-bid share price performances of bidders and targets, and the subsequent turnover in the management of the acquired firms.¹⁷

Unfortunately, the evidence on management turnover is rather mixed. Working with US data on 102 targets over the period 1975-79, Walsh and Ellwood (1991) report results that management turnover in AD firms is higher in the two years post-acquisition, than in a control group of non-acquired firms. Higher management turnover post-takeover is also confirmed by other studies,

¹⁷ Of course, the accounting studies reviewed earlier in the chapter are also capable to providing a direct test, although because of concerns about the quality of accounting data, financial economists tend to eschew its use.

(Furtado and Karan, 1990; Martin and McConnell, 1991). However, Walsh and Ellwood were unable to find a significant relationship between the level of turnover and the pre-bid performance (measured by stock returns) of targets. Furthermore, they consider the possibility that turnover in the first year post-acquisition might be driven by voluntary quits, because acquired managers might not want to be associated with acquiring firms that had demonstrated poor performance in the pre-bid period. (Kennedy and Limmack, 1996 dispute this finding for UK data.)

Walsh and Kosnik (1993) focussed on the impact of 59 US corporate raiders during 1979-83, positing that the only *raison d'être* for such raids is the removal of inefficient management. They did find some evidence of post-raider management turnover for targets with 'sustained histories of poor performance', but this did not apply to the full sample. Interestingly, they also found that the actions of a raider could have 'diffused' impacts on management turnover for poorly performing non-raided rivals of targetted firms. However, Walsh and Kosnik conclude by saying that they found '... little support for [the] hypothesized discipline'.

Following on from the findings about the diffusion of the disciplinary threat, the recent study by Mikkelsen and Partch (1997) examined management turnover and pre-bid performance for two groups of US non-acquired firms. The first consisted of 227 firms for the period 1984-88, an era of high levels of activity in the US takeover market. The second was a group of 218 firms during the period 1989-93, when takeover activity was relatively low. In the active period, 33 per cent of firms in the lowest quartile of performers (measured by return on assets) experienced complete turnover of president, board chair and CEO, compared to only 17 per cent in the less active period. The difference was significant at the one per cent level. Mikkelsen and Partch (1997) draw two conclusions from their results. First, that the disciplinary *threat* of takeover exists even when takeover does not actually occur. But second, that that disciplinary threat varies over time and depends for its potency on the level of aggregate activity.

In the UK, Franks and Mayer (1996) examined a sample of 59 hostile takeovers between 1985 and 1986. They reported high levels of management turnover in the acquired firms, together with very substantial restructuring of the acquired assets. However, they found little evidence of poor

pre-bid performance (using four measures, including stock returns) for the acquired firms. Franks and Mayer (1996: 180) conclude: 'The [UK] market for corporate control does not therefore function as a disciplinary device for poorly performing companies.'

In contrast, the study by Kennedy and Limmack (1996) reaches a somewhat different conclusion. They examined 240 targets and 247 bidders for the period 1980-89, dividing their target sample into 161 'disciplinary bids' (where the CEO was replaced) and 79 'non-disciplinary bids'. For the full sample they found that targets had significantly negative excess returns for substantial periods in the 5 years prior to a bid, with bidders achieving superior performance. From this Kennedy and Limmack (1996: 282) conclude that: 'These results are consistent with the role of takeovers in the UK as part of the disciplinary mechanism on inefficient companies'. However, they also report negative post-acquisition returns to acquirers, which they point out is inconsistent with neo-classical theory and the efficient market hypothesis.

In addition Kennedy and Limmack (1996) also examined the disciplinary function of takeovers from a slightly different perspective. They report a significant increase in CEO turnover for all targets in the two year period following takeover. For 'disciplinary' targets increased CEO turnover was linked to pre-bid performance poorer than that of 'non-disciplinary' targets. Disciplinary targets attracted a higher premium, (possibly reflecting the anticipation of greater post-takeover gains by bidders), but the significantly negative returns to the associated bidders suggest that those gains are 'over-estimated'. Thus Kennedy and Limmack provide somewhat contradictory evidence about the disciplinary hypothesis.¹⁸

If managers make 'bad' acquisition decisions, in the sense that they appear to have adverse consequences for shareholders, then do these 'bad' decisions have adverse consequences for the managers who make them. In other words, do managers who make bad acquisitions become, in turn, vulnerable to the threat of take-over and the loss of office?

¹⁸ Kennedy and Limmack suggest that the negative post-takeover returns to successful bidders could be due to the secular rise in bidders' pre-bid performance, and so the decline might be independent of the takeover as such. However, this suggests that takeover decisions might have at least as much to do with the performance of bidders, as the performance of targets. This in turn could suggest that the disciplinary role of takeovers is unlikely to operate consistently over time.

US evidence from Mitchell and Lehn (1990) does indeed suggest that 'bad' acquisition decisions are likely to increase the probability of subsequent take-over or divestiture. Unfortunately, Mitchell and Lehn do not separate their results for these two outcomes, and so this evidence can only be regarded as suggestive. In contrast, a later US study from Loderer and Martin (1990) suggests that there is little evidence for 'bad' decisions resulting in subsequent takeover and loss of office. Furthermore, and on the contrary, some UK evidence suggests that one of the key managerial motives for engaging in acquisition is to reduce vulnerability to takeover, (Newbould, 1970; Ingham, Kran and Lovestam, 1992).

6.2 Managerial Motives for Mergers

A variety of motives or strategies have been suggested as alternatives to the disciplinary hypothesis, (Copeland and Weston, 1988; Weston *et al.*, 1990; Sudarsanam, 1995). Some of these alternative strategies will be examined briefly.

First, a number of studies have suggested that some bidders attempt to acquire an already successful firm in order to boost their own firm's performance, (Ravenscraft and Scherer, 1989; Herman and Lowenstein, 1987). To the extent that it is possible to test this hypothesis, then US evidence suggests that this is not a strategy which will be valued by the market, (Lang, Stulz and Walkling, 1989).

Diversification has also been advanced as a reason for acquisition. While there is some evidence to suggest that this strategy is likely to lead to '... systematically lower and predominantly negative returns', (Morck, Schliefer and Vishny, 1990), the evidence on the wealth effects of unrelated acquisitions is mixed, (for example, see Limmack and McGregor, 1995; Flanagan 1996). Nevertheless, both voluntary and forced unbundling of firms which had diversified via acquisition during the 1960s and early 1970s, has been a feature of much merger activity during the 1980s, (Shleifer and Vishny, 1991). Firms which undertake voluntary divestments of a earlier and unprofitable acquisition, are supported by the market in these efforts. Overall the evidence suggests that shareholders obtain positive returns from this form of corporate de-coupling, (Jain, 1985; Jensen, 1986a). Furthermore, there is evidence that the larger the 'spin-off' the larger the gains, (Miles and Rosenfeld, 1983), as is also the case when divestment is to relieve financial

distress, (Lasfer *et al.*, 1992).

The attempt to achieve increased 'market power' could be another obvious, if understandably non-explicit managerial motivation for merger. Despite the obvious appeal of such motives, US research suggests that the dominance of market power motives is not corroborated by the evidence, (Dodd and Ruback, 1977; Eckbo, 1983; Stillman, 1983). However, given the broadly negative regulatory stance with regard to horizontal acquisitions in the US, perhaps such findings are not surprising, (Shaw and Simpson, 1986). In the UK, where horizontal mergers dominate, perhaps due to more relaxed regulation, Limmack and McGregor (1995) suggest that even if market power is the underlying motive, it is not a strategy that is valued by the market.

The 'hubris hypothesis', advanced by Roll (1986), provides an interesting extension to the work on managerial motivations for acquisitions. It suggests that superior performance can motivate managers to assume that they will be able to extract large gains from a target, leading them to pay too high a premium. There is some empirical support for this hypothesis, (Firth, 1980; Asquith, 1983; Varaiya, 1985), although other studies have yielded negative results, (Bradley, 1980). Indeed, as Roll (1987) argues, the hubris hypothesis 'cannot be the sole explanation' for takeovers. Even so, an interesting feature of this work is that managerial hubris provides an explanation for negative outcomes which does not rely on managers trading off their own interests against those of shareholders. It stands in contrast to managerial theories which suggest that the separation of ownership and control make managerial utility maximisation (via growth) a more likely motive than shareholder wealth maximisation, (Berle and Means, 1932; Marris, 1963; Baumol, 1967; Weidenbaum and Voigt, 1987).

There is a considerable body of evidence which suggests that growth and firm size are more important determinants of managerial remuneration, than profitability,¹⁹ (Cosh, 1975; Cosh and Hughes, 1987; Szymanski, 1992; Gregg *et al.*, 1993; Conyon and Gregg, 1994; Conyon and Leech, 1994). If it is accepted that size and growth are the largest determinants of executive remuneration, and that growth by merger can be achieved almost instantaneously, then it is at least

¹⁹ Such growth, of course, need not necessarily be against shareholder interests.

plausible that growth *per se* is a major managerial motivation for engaging in acquisitions.

Some indirect support for a *growth-for-its-own-sake* hypothesis is provided by US evidence which suggests that strategies to achieve growth via capital investment in productive assets are considerably more profitable than by acquisition, (McConnell and Muscarella, 1985; Mikkelsen and Ruback, 1984; Hite, Owers and Rogers, 1987; Ravenscraft and Scherer, 1987; Porter, 1987).

However, recent US evidence on the executive pay-size-performance relationships suggests that when *changes* in size is the independent variable, the correlation between size effect and compensation, while still statistically significant, is much smaller (adjusted $R^2 = 0.079$) than when size is measured in *levels*, (Lambert, Larcker and Weigelt, 1991).

Also as Bruce and Buck (1997) point out, the UK studies have tended to ignore stock options and other forms of deferred compensation, which have become increasingly important in recent times. When Main *et al.* (1996) did account for stock options awarded to the highest paid executives of 59 UK firms, 1982-89, their results demonstrate a significant increase in the compensation-performance relationship. As a result, the impact of size and growth on compensation was diminished, though still prominent.

6.3 Incentives for 'Good' Merger Decisions

One of the most obvious incentives that acquiring-firm managers have to make value-maximising acquisitions, is if a substantial part of their own wealth is affected. Jensen and Murphy (1990:37) summarise this argument thus: "... the most powerful link between shareholder wealth and executive wealth is direct ownership of shares by the CEO." Outside the specific context of the mergers literature, there is evidence that the adoption of equity-related compensation plans are valued by the market, (for example, Tehranian and Waageleir, 1985). In a similar vein, other studies have shown that such adoptions can have a positive impact on the propensity to commit to long term investment, (Larcker, 1983), and on long term performance measured by shareholder wealth, (Brickley, Bhagat and Lease, 1985). In this section the impact of management equity holdings on acquisition outcomes is re-examined, (see Section 5.6.1 above).

Following the now familiar work on problems of agency, Lambert and Larcker (1985) identify three categories of potential agency conflict. First, managers have a propensity to consume perquisites, including increasing firm size to increase their own compensation. Second, managers have difficulty in diversifying their employment risk, and so might be more risk averse than shareholders. Third, they might tend to have shorter time horizons than shareholders.

Obviously, all three of these problems could be germane to situations involving decisions about acquisitions. If so, and if the conflict between principals and agents is not easily resolvable in a way which provides mutual advantage, then there is a danger of managers utilising information asymmetries to make acquisition decisions which serve primarily their own ends. The question is - are these potentialities for agency conflict resolvable? Put another way, is it possible to devise appropriate managerial compensation packages which ensure that managers operate in the interests of shareholders?

In a study designed to examine the impact of various forms of managerial incentives on merger outcomes, Petry and Settle (1991) point to four elements, any or all of which could make up such a compensation package. These include: salary or deferred salary; performance contingent awards; shares or share substitutes; share options or substitutes. Their tests for the impact of various combinations of these elements on the outcomes of acquisitions (despite the prognostication from Jensen and Murphy, 1990 cited above) are not encouraging. Petry and Settle (1991: 113) summarise their results in the following way: "Overall, no single form of compensation has been shown to give systematically better results for shareholders."

A related line of enquiry is provided by Firth (1980). His study shows that the larger the managerial equity stake, the lower the probability that managers will initiate an acquisition.

Lewellen, Loderer and Rosenfeld (1985), find a positive, but statistically insignificant, correlation between returns to AG shareholders and the equity stakes of top management. The inconclusive nature of these results is also confirmed by Tehranian, Travlos, and Waagelein (1987), who cast doubt on the extent to which equity incentive schemes have an impact on acquisition performance.

A more recent study by Loderer and Martin (1997) examined this issue in a simultaneous equations framework. They argue that this is necessary because the direction of causation in the acquisition outcome-management equity stake relationship cannot be judged *a priori*. With a sample of 867 US acquisitions over the period 1978-88, they find a small but positive impact when acquisition performance is regressed on management equity ownership. But Loderer and Martin (1997: 251) find that:

"That relationship vanishes, however, when the problem is cast in a simultaneous equations framework in which managerial stock ownership affects performance and, at the same time, prospective performance is a determinant of managers' decision to hold own-firm stock. If anything, the sign of the relation is reversed."

Another recent US study on executive equity holdings, albeit set in a general, rather than an acquisitions context, casts an interesting light on the issue. In their study of 1394 US firms, Denis *et al.* (1997) find that top executive turnover is higher in poorly performing firms with low managerial stockholding, than in poorly performing firms with higher executive stockholding. The difference between the two groups was statistically significant. Despite the potential entrenchment effects of executive stockholding, Denis *et al.* conclude that such holdings still serve to align the interests of managers and shareholders and might not, therefore, be entirely counter-productive from the shareholders' perspective.

Research into these matters is still at a relatively early stage. It is, therefore, probably too soon to form definitive conclusions about the impact that compensation packages and equity holdings have on returns to the shareholders of acquiring firms. However, Morck, Schliefer and Vishny (1989), and Cosh and Hughes (1987), writing about corporate governance in the USA and the UK respectively, provide evidence that internal control mechanisms and incentives for managers are weak and ineffective. Executive directors appoint non-executive directors, (often executive directors in other firms), who are then responsible for making recommendations to shareholders on the appropriate compensation packages for the executive directors. Furthermore, in the UK, institutions seem reluctant to give an active mandate to the nominees whom they place (rarely) on boards of firms in which they hold shares, (Cosh and Hughes, 1987).

7. SUMMARY & CONCLUSIONS

In an attempt to draw together the different strands of empirical evidence, a worthwhile starting point is provided by the question posed at the outset: do mergers and acquisitions increase value, profits and efficiency? From this review of the evidence it appears to be difficult to arrive at definitive conclusions and thus provide an unequivocal answer to that question. The difficulty is summarised succinctly by Scherer (1988:69): "Some takeovers enhance economic efficiency, some degrade it, and the balance of effects, though not fully known, is most likely a close one." Furthermore, even within the event study literature, research studies are rarely consistent one with another, (Roll, 1987), added to which the sheer volume of evidence also presents difficulties, (Mueller, 1989).

7.1 The Theoretical Bases of Interpretation

Regardless of the obvious difficulties in interpreting the vast extant literature, replete with inconsistencies and contradictions, unequivocal policy inferences are not (surprisingly) difficult to find.

For example, from the UK Department of Trade and Industry (1988: para. 2.11):

"A particular advantage of avoiding government intervention as much as possible in the market for productive assets is that the threat of takeover has a salutary effect on the incumbent managements of public companies. They should be under the discipline of having to demonstrate to their shareholders that they are running the company as efficiently as possible. Any government action which places obstacles in the way of takeovers weakens this discipline. There needs to be a strong case for government intervention to prevent a takeover if this advantage of non-intervention is to be set aside."

And from the US, Jensen (1986a: 7):

"The market for corporate control is creating large benefits for shareholders and for the economy as a whole. The corporate control market generates these gains by loosening control over vast amounts of resources and enabling them to move more quickly to their highest-valued use. This is a healthy market in operation, both on the takeover side and the divestiture side."

In general, financial economists are clear that mergers and acquisitions are value-enhancing events. In specific situations, for instance in the face of over-capacity in a declining industry, a strong *a priori* theoretical case can be made for mergers, (Dutz, 1989). And indeed a strong empirical case has been made for the takeover market as an efficient facilitator of such economic rationalisations, as in the case of the US oil industry in the 1980s, (Jensen, 1987). Nevertheless, one is still left with a considerable body of evidence which is inconsistent with the efficient markets framework from which financial economists proceed.

On the other hand industrial economists have tended to take a rather more sceptical stance with regard to the empirical evidence, and have often provided more balanced, if sometimes tendentious reviews; (Scherer, 1988; Mueller, 1989; Caves, 1989).

A partial explanation for the differences in interpretation that exists between economists from these two traditions, can be found in their respective points of departure, and also in the issues with which they are concerned. First, industrial economists, observing the pervasive presence of market concentrations and oligopolistic behaviour, tend to be somewhat suspicious of unhindered market transactions that restructure the corporate landscape into larger agglomerations.

In contrast, when financial economists begin their examination of mergers and acquisitions, they invariably start from the predicate of stock market efficiency. However, as discussed in some detail in the following chapter, event studies on mergers and acquisitions have made a substantial contribution to the empirical efforts to validate the theory of market efficiency, (Fama, 1991). In the course of a major review of the efficient market hypothesis, Fama (1991:1602) provides the following remarks:

"To be fair, and to illustrate that efficiency issues are never entirely resolved, I play the devil's advocate. (Attacks on efficiency belong, of course, in the camp of the devil.)."

It might be reading too much into this passage, but the use of the word "entirely" and the omission of an exclamation mark at the end of the parentheses are perhaps instructive in relation to the theoretical starting point of financial economists. Markets are efficient by assumption: but clearly such an assumption is not without its difficulties, particularly if it is used to measure the

scale of economic consequences due to mergers. For example, take the efficiency definition offered by Fama (1991: 1575):

"I take the market efficiency hypothesis to be the simple statement that security prices fully reflect all available information. ... A weaker and economically more sensible version of the efficiency hypothesis says that prices reflect information to the point where the marginal benefits of acting on information and contrast it with that from Black (1986, p. 533) in his presidential address to the American Finance Association: '[W]e might define an efficient market as one in which price is within a factor of 2 of value, i.e., the price is more than half of value and less than twice value. The factor of 2 is arbitrary, of course. Intuitively, though, it seems reasonable to me, in the light of sources of uncertainty about value and the strength of the forces tending to cause price to return to value. By this definition, I think almost all markets are efficient almost all of the time. 'Almost all' means at least 90 percent'."

In focusing almost entirely on share-price reactions to merger announcements, the research concerns of financial economists are clearly situated in the domain of the private gains, (for example, Jensen and Ruback, 1983; Jensen, 1986a; Bradley and Jarrell, 1987; Jarrell, Brickley and Netter, 1988). When public policy issues are raised in this literature the focus is invariably on how the market for corporate control, already presumed to be efficient, is being distorted by government intervention or the lack of it, (Baron, 1983; Jensen, 1986a; Shliefer and Vishny, 1986).

In almost complete contrast, industrial economists (with notable exceptions such as Demsetz, 1973, 1974) tend to be concerned with issues having to do with problems of public interest and social welfare loss and with the construction of policy in order to intervene to correct market failure.

7.2 The Economic Consequences of Mergers & Acquisitions

Mergers and acquisitions, particularly if conducted on the scale witnessed during the 1980s, clearly have important implications for a variety of economic actors and for the functioning of economies. In terms of actors, these would include shareholders, corporate management teams, employees, consumers, creditors, and governments and their agencies. In terms of economic welfare there are potential consequences (both positive and negative) for capital, product and labour markets. These consequences could include: changes in concentration; abuse of market

power and featherbedding; international competition; rationalisation of excess capacity; the realisation of economies of scale and scope, as well as other synergistic benefits.

To expect any one study to account for all these factors is, to say the least ambitious. Nevertheless, it is to some or all of these matters to which policy makers in both the public and private domains have to address themselves. So how can knowledge of the empirical evidence be applied in a way which might provide insights into the consequences of mergers and acquisitions for welfare, both public and private?

Surprisingly, perhaps, some industrial economists and financial economists seem agreed on how such insights might be gained. Whilst disagreeing at a fundamental level on their respective interpretations of the empirical evidence, both Caves (1989) and Bradley (1987) are agreed on the primacy of one question: do mergers and acquisitions lead in fact to an improvement in the productivity of corporate assets? Or, to put the same question in a slightly different way: is it the case that efficient corporate management teams displace the less efficient? What does this examination of the empirical literature suggest?

In both the UK and the USA, *ex post* studies of post-acquisition performance provide fairly consistent evidence (with some exceptions) that mergers and acquisitions, on average, fail to improve profitability. In the UK, by and large, the *ex ante* studies of share price reactions are much less consistent. In contrast, in the USA the *ex ante* studies of wealth effects suggest, on balance that mergers and acquisitions might be value-enhancing events: although there is a considerable body of negative evidence to contend with. How can these bodies of evidence be reconciled and used to address questions about the impact of takeovers on the productivity of corporate assets?

An approach is suggested by Bradley (1987: 172):

"Why not conduct one study that combines the methodology of event studies with the more traditional approaches of industrial organization? One could then test directly whether capital market agents were able *ex ante* to anticipate the *ex post* performance of acquiring firms. ... Unless and until the empirical results of event studies are reconciled

directly with the empirical work on post- acquisition performance, I am afraid that the arguments made by financial economists and industrial organization specialists concerning the welfare implications of corporate mergers will continue to pass like ships in the night."

The empirical research which forms the substantive part of the current project will be an attempt to pursue Bradley's injunction. Whilst, at best, the outcome is likely to provide only an indirect test of whether mergers and acquisitions improve the productive efficiency of corporate assets, the attempt to reconcile the current impasse between industrial and financial economists will, hopefully, prove worthwhile.

CHAPTER 3

Methodological Issues & Research Methods

1. INTRODUCTION

This chapter will present a critical examination of the methodological approaches adopted in the empirical research literature concerned with mergers and acquisitions. This is done in order to devise a research strategy which will match the main aims of the current research, including the attempt to reconcile the results generated by the two methodologies. The product of this chapter will then provide an appropriate point of departure for the empirical stages to follow.

The review of theoretical contributions in the first chapter, demonstrated that an all-encompassing general theory of mergers and acquisitions has yet to be produced. Consequently it will be argued below that no one methodological approach obviously dominates all others. Therefore, a thorough review of the methodological issues involved would seem to be an appropriate starting point.

The review of the voluminous empirical literature in Chapter 2 demonstrated, *inter alia*, that: (a) despite the extensive research into the acquisitions phenomenon, there are still a number of gaps in our knowledge and understanding; (b) a number of puzzling results are still to be explained; (c) there are a considerable number of controversies which have yet to be resolved. From the empirical review it is clear that despite its recent hegemony, the event study research technology has not delivered a totally convincing and consistent body of evidence. Therefore, from an empirical perspective, reconsideration of the methodological issues is also required, .

As observed already, financial economists and industrial economists have often given very

different interpretations to empirical results, and these interpretations have given rise to much contention and dispute in the literature, (Bradley, 1987; Mueller, 1989). To some extent this can be explained by the very different research methodologies that the two groups have tended to employ - broadly, event studies on the one hand, versus accounting studies on the other. Any attempt to reconcile the contradictions and inconsistencies in the empirical literature must first attempt to find a way of reconciling the two methodological approaches. Following the contributions of Bradley (1987), Caves (1989), Higson (1991), and Healy, Palepu and Ruback (1992), it will be argued below that this attempt to reconcile the different results generated by the two methodologies requires the utilisation of both.

The rest of the chapter is structured as follows. The next section investigates the strengths and weaknesses of the event study methodology. In it the crucial nature of the Efficient Markets Hypothesis (EMH) is examined, and also the implications of applying that particular concept to the market for corporate control. This leads to discussion of the drawbacks of using abnormal stock returns as the sole measure of the economic consequences of mergers and acquisitions.

The third section identifies the weaknesses inherent in the use of published accounting data. In particular, consideration is given to the bias and distortion likely to be encountered when using accounting data constructed under the conventions of the accruals paradigm. Following this critical review the fourth and final section presents a summary and concludes that the use of both share price data and accounting data offer advantages, is both possible and offers the potential for research synergies and mutual reinforcement.

2. THE EVENT STUDY METHODOLOGY

2.1 Event Studies and Market Efficiency

The event study has become the dominant methodology for research into the economic effects of mergers and acquisitions. For reasons outlined by Caves (1989: 151), it has largely replaced research based on the use of accounting data. Not the least of these reasons is the methodological problems encountered in the use of published accounting data. Despite the hegemony which it has achieved, the event study approach is not without its own methodological deficiencies, even

though these are often not made explicit by the researchers who employ it, Fama (1991).

As Keane (1983: 63) points out, when considering methodological alternatives, it is important to examine and to make clear the priors that are implied by those methodologies. In the case of the event study methodology stock market efficiency is an important assumption. It is only from this starting point that the results generated by event studies, (abnormal share price returns), can be used as the measure of the economic success (failure) of mergers and acquisitions. This means, in the language of the efficient markets literature, that the Efficient Markets Hypothesis (EMH) holds in both weak and semi-strong forms. That is, stock markets respond instantaneously and fully reflect new, relevant, *public* information,¹ (Copeland and Weston, 1988). In other words capital markets are required to be efficient in both "allocational" and "operational" terms.

Operational efficiency requires that information is freely available and that transactions costs are negligible. While this issue is of some significance to acquisitions research, (transactions costs are obviously non-negligible in most cases), a much more important consideration is the issue of allocative efficiency. This requires that stock markets set prices such that the marginal rates of return on projects are equal to the marginal rates of return required by investors. Thus the term *fully reflect* used in the semi-strong definition of the EMH means that stock prices must be the *correct* prices. That is, share prices reflect the present value of expected cash flow streams: for mergers and acquisitions this means the present value consequences expected to result from such transactions. Given the crucial nature of the EMH for event study methodology, it is examined next in some detail.

¹ Fama (1970) defines efficiency as "... all prices fully reflect all *relevant* information". Thus efficiency depends on what is understood by the term *relevant*. LeRoy (1976) asserts that such a definition is tautology, empty of significance for empirical economics. Fama (1976) rejects LeRoy's assertion, but does modify the formulation to "all publicly available" information. Jensen (1978) offers yet another way of maintaining Fama's original formulation by the introduction of information costs. Agents will pay to discover and use information up to the point where marginal benefits and costs are equal. But, Ball (1992) points out, this means that efficiency becomes an increasing function of information and trading costs. Further, Grossman and Stiglitz (1980) have demonstrated that for markets to reflect fully *all* available information, both information and transactions costs would have to be zero. Therefore, when Fama (1991) uses the formulation of efficiency in terms of "all information", he seems to revert to the original, tautological definition.

2.1.1 The Empirical Evidence on Market Efficiency

There have been many attempts to validate the EMH empirically, but all suffer from the intractable *joint hypothesis* problem, (Roll, 1977; Fama, 1991).² This is a crucial issue. Any test for market efficiency requires the use of an equilibrium asset pricing model, which is both theoretically well-grounded and empirically validated: Capital Asset Pricing Model (CAPM) is such a model:

$$(1) \quad R_i = R_f + (R_m - R_f)\beta_i$$

Where R_i represents the required rate of return on security i ; R_f is the risk-free rate of return; R_m is the expected return on the market portfolio.

Whilst theoretically well-grounded, the empirical validity of CAPM is open to serious question, not least because one of the necessary and crucial assumptions underpinning the CAPM is capital market efficiency. In other words *testing* for market efficiency with CAPM means the use of a model that *assumes* market efficiency. In the light of this joint hypothesis problem, considerable care must be exercised when interpreting the results from empirical verifications of the EMH. It could be argued that such care has often not been exercised in the literature.

Fama (1970, 1991) has conducted two influential reviews of the vast efficient markets literature. In the latest he states that:

"..., judged on how it has improved our understanding of the behavior of security returns, the past research on market efficiency is among the most successful in empirical economics," (Fama 1991: 1576).

Despite being the progenitor of the EMH, on the basis of 182 empirical works he reviewed, Fama is careful to eschew any unequivocal endorsement of market efficiency. In particular, he is very circumspect about the extent to which prices can be expected to (sic) fully reflect

² It is interesting to note *en passant* the substantial contribution made by the empirical research on mergers and acquisitions to the quantum of event studies evidence used to test for market efficiency.

information, preferring instead to measure market efficiency in terms of the speed of the initial price response.³ In concluding his review Fama (1991: 1607) states:

"The cleanest evidence on market-efficiency comes from event studies, ... When an information event can be dated precisely and the event has a large effect on prices, the way one abstracts from expected returns to measure abnormal daily returns is a second-order consideration. As a result, event studies can give a clear picture of the *speed of adjustment* [emphasis added] of prices to information."

The results from a large number of event studies demonstrate rapid response, and these are cited approvingly by Fama as evidence in support of market efficiency. But, although speed of response to new information is a *necessary* condition for market efficiency, it is not a *sufficient* condition, as made clear by Keane (1983: 3):

"Efficiency, therefore, refers to the two aspects of a price adjustment to new information, the *speed* and *quality* (direction and magnitude) of the adjustment. Sometimes it is suggested that efficient market researchers refer only to the speed aspect. This is quite incorrect. It would clearly be an odd interpretation of efficiency if a doubling in the price of a share were regarded as an efficient reaction to new information, simply because the movement was instantaneous, if in fact it warranted a substantial reduction in the price. Both aspects of the price reaction are equally important."

Returning to the issue of the dual hypothesis problem: Fama (1991) is clearly aware of it because he argues specifically that deployment of the Market Model rather than the CAPM obviates (some) of these difficulties. As he points out, following the work of Sharpe (1963) and the seminal contribution to the development of event study methodology by Fama *et al.* (1969), most event study researchers have indeed opted to use the market model, or some variant of it, rather than the CAPM.

Fama maintains that as an *ex post* version of the *ex ante* CAPM, the market model is less 'susceptible' to the joint hypothesis problem. This argument receives support within the

³ It is interesting to note the subtle transformation in the definition of semi-strong form efficiency from its introduction in Fama (1970) to its effective revision in Fama (1991). In its original form efficiency requires to reflect new information in full, but this has been elided over time and the definitional focus has been shifted to speed of response.

finance literature, (for example, Bromwich, 1992; Copeland and Weston, 1988). But, as these authors also point out, use of the market model only eases the joint hypothesis problem to the extent that it is not derived in a theoretically rigorous way. The drawback of its use is, then, its lack of provenance in any version of capital market theory. A test for market efficiency, requires a specific model of the share price generating process, in order to generate benchmark returns. While CAPM is neutral with respect to returns generation, the market model can perform that function. However, the market model is consistent with a number of equilibrium pricing models. Therefore, it can only be posited as simply representative of an empirical regularity between the returns to a stock and a particular stock market index.⁴

Because of its lack of theoretical provenance, Fama (1991) argues that the the market model does not rely on the assumption of stock market efficiency, (unlike CAPM). However, when the market model is used to generate an 'efficient' benchmark for the purpose of measuring abnormal stock price returns, the assumption of market efficiency seems unavoidable. But if market efficiency is defined solely in terms of the speed of response to new information, Fama (1991), then the assumption of efficiency is almost unnecessary. On the other hand, if efficiency is taken to mean that prices also 'fully reflect' new information in the way that has been defined above, then market efficiency is a necessary assumption of the event study methodology.

In the case of mergers and acquisitions, it is the latter definition which is claimed by financial economists such as Jensen and Ruback (1983), when they argue for the value gains and economic benefits of these transactions. This conclusion is inescapable, because abnormal returns generated from the market model are used as the *sole metric* for assessing those value gains and economic benefits.

2.1.2 The Problem of Risk Adjustment

Although the market model is not theoretically well specified, it uses the same systematic risk measure as the (empirical) CAPM. Unfortunately, recent work has called into question the

⁴ Dyckman, Downes and Magee (1975), Roll (1977), and others have pointed out that the market indices used typically in market model studies is not the equivalent of the theoretically determined market portfolio of CAPM.

empirical validity of beta as an appropriate risk measure.

In a recent US study, employing a large, cross-section sample for the period 1963-90, Fama and French (1992) find no reliable relation between beta and average stock returns for the NYSE, AMEX and NASDAQ exchanges. Instead, they report that firm size, as represented by market capitalisation, (ME), and the ratio of book value to market value, (BE/ME), account for most cross-sectional variation in stock prices, with beta adding nothing to the explanatory power of their regressions. Furthermore, when controlling for size, they find that BE/ME explained significant differences in stock returns, and the converse was also the case. Adding beta added nothing by way of explanation when allied to either size or BE/ME.

These findings suggest that earlier event study results have been either subject to significant measurement error, or that the basic market model is seriously mis-specified. Fama and French (1992) check the robustness of their findings by lengthening the sample period to 1941-90, but again beta is found to have statistically insignificant explanatory power. For a sub-period of the sample, 1941-65, beta was significant, which accords with earlier findings, (Black, Jensen and Scholes, 1972; Fama and Macbeth, 1973), but when size was controlled for, again beta was insignificantly different from zero.

Fama and French (1992) are cautious about the implications of their findings. However, after consideration of alternative explanations of the empirical results, they were forced to conclude that size and BE/ME provide better proxies for risk than beta. They suggest that their findings are probably consistent with rational pricing, although they offer little theoretical explanation for this assertion. As might be expected, these findings and conclusions have not gone unchallenged. Using the Fama and French data, but alternative statistical techniques, Amihud, Christensen and Mendelson (1992) re-established the explanatory power of beta, although the suspicion remains.

In an alternative approach to the issue, Chan and Lakonishok (1992) report very similar findings to Fama and French (1992) for the period 1926-90. However, when the sample period was shortened to 1926-82, they report that beta's explanatory power was restored. The

explanation offered for these results is interesting because it relies on institutional changes in the behaviour of investors. Chan and Lakonishok point out that since the early 1980s, there has been a very significant increase in attempts by fund managers to match specific market indices. This, they argue, has been brought about because the same fund managers have been convinced by the evidence on market efficiency and CAPM. The logic for this is that if on average fund managers cannot expect to 'beat the market' consistently, then they will give up trying to do so. Instead they will offer 'tracker funds'. The result of this change in investing patterns has been for large capitalisation stocks to be in great demand, because these stocks are the ones which tend to make up the indices which the fund managers are tracking. This institutional factor, Chan and Lakonishok claim, can account for the observed pattern of returns to all quoted stocks, large and small alike, since 1982 and thus has changed (perhaps only temporarily) the empirical significance of beta.

This strand of empirical research into efficiency is only at an early stage of development and much more work is required before the difficulties raised by it have been resolved. Nevertheless, such evidence, and the development work on the Arbitrage Pricing Model, (Roll and Ross, 1993), is sufficient to warrant caution about how the results of event studies based on the market model are interpreted and also the reliance placed on beta as a measure of risk.⁵

2.1.3 Empirical Regularity as a Measure of Efficiency

Fama (1991) argues that event studies have added greatly to knowledge and understanding about stock markets and the way that they function. In particular, he considers that event studies have unearthed reliable empirical regularities, capable of replication. Even if event studies cannot be relied upon to provide accurate quantification or measurement of the gains (losses) to merger activity, they have revealed that the market responds rapidly to merger announcements. If event studies provide consistent empirical results across different samples and different time periods, he suggests that this might allow confident predictions about the economic consequences of mergers and acquisitions.

⁵ Perhaps because of this problem with beta, a number of recent studies have reported very different results (particularly over longer event windows) for the market model and the alternative market-adjusted model, where beta is constrained to equal one, (Limmack, 1991, Franks and Harris, 1989).

In the field of mergers research, there is clear agreement about the existence of at least one empirical regularity: that of statistically significant and large gains to target shareholders. But there is certainly no such a consensus about the sign and scale of bidder returns, (Limmack, 1991; Bradley, 1987). Even so, a number of reviewers have considered that enough studies have reported bidder returns that are insignificantly different from zero, to warrant this as an empirical regularity, (Jensen and Ruback, 1983; Jarrell, Brickley and Netter, 1988). Re-examination of these claims suggests that an alternative interpretation is possible.

In the US, the majority of studies have indeed reported announcement period bidder returns, that were insignificantly different from zero, (Jensen and Ruback, 1983; Jarrell, Brickley and Netter, 1988). However, there is evidence that the scale of these returns has declined over time, (Jarrell, *et al.*, 1988; Bradley, *et al.*, 1988). In the UK, by contrast, the evidence is more mixed, (Limmack, 1991). Some studies have reported significant positive returns at announcement, (Franks *et al.*, 1977), others have reported insignificant returns around zero, (Barnes, 1978; Firth, 1979, 1980; Franks and Harris, 1989; Limmack, 1991), and some recent studies have reported significant negative returns, (Limmack, 1991 - on a value-weighted basis; Sudarsanam *et al.*, 1996).

If the finding of zero announcement returns to US bidders could be considered an empirical regularity, the evidence of significant negative post-acquisition returns also constitutes an empirical regularity, (Jensen and Ruback, 1983; Jarrell, Brickley and Netter, 1988). There is some very limited evidence for positive post-acquisition returns, (Franks, *et al.*, 1991; Healy, *et al.*, 1992), but the more typical result is for significant negative returns, (Agrawal, Jaffe and Mandelker, 1992). As most researchers have observed, these negative returns are clearly inconsistent with the efficient market paradigm. Negative post-acquisition returns are also a consistent feature of UK studies, (Limmack, 1991; Kennedy and Limmack, 1996; Gregory, 1997), although again a small number have suggested that bidders might achieve positive returns in some periods, (Franks and Harris, 1989; Higson and Elliott, 1998).

An issue that has to be considered when weighing the empirical regularity of bidder returns is the variations in research design and the impact that these might have on reported results.

Recall that Fama (1991: 1607) states that, provided an announcement can be dated with precision and has a substantial impact on share prices, "... the way that one abstracts from expected returns to measure daily returns is a second-order condition." The evidence would suggest that either these conditions are rarely met, or research design and choice of benchmark are rather more important considerations. The potential importance of these factors is exemplified well by Maggenheim and Mueller (1988) and Bradley and Jarrell (1988). Using the same data sample, but different research designs and event windows these two studies report diametrically opposite results and conclusions. But while some studies have suggested that choice of benchmark and allowance for factors such as firm-size can be critical for the sign of post-acquisition returns, (Franks and Harris, 1989; Franks, *et al.*, 1991; Limmack 1991), others have reported that benchmarks and firm-specific or transaction-specific factors have little or no impact, (Gregory, 1997).

Even in the case of announcement period results, (particularly in the UK), it seems difficult to claim an empirical regularity in the pattern of returns to acquiring firms. A more substantial claim can be made for regularity in the post-acquisition results, but the negative drift for bidder returns, is clearly incompatible with market efficiency. So, claims for market efficiency based on empirical regularity are at least open to considerable doubt. That being so, the use of announcement period abnormal returns as the *sole measure* of the economic consequences of mergers and acquisitions seems highly questionable.

2.1.4 Efficiency and Post-Acquisition Returns

From an efficient markets perspective, clearly the most worrying evidence from the event study literature concerns the negative post-acquisition drift in the returns to successful bidders. Even if the studies with negative announcement returns are ignored, the subsequent negative post-acquisition returns reported in so many studies are " ... unsettling because they are inconsistent with market efficiency ...", Jensen and Ruback, 1983: 20). If zero announcement returns represent an unbiased measure of the economic consequences of mergers, in an information efficient market that should be the end of the story. Subsequent reversals suggest that either the announcement period or that the post-merger results are incorrect.

Jensen and Ruback (1983) suggest that, unless the market *systematically* overestimates the future gains from acquisitions, it is possible that the secular decline of post-acquisition returns is due to measurement error. One source of measurement error could be abnormally positive pre-bid performance of bidders which has been reported in a number of studies, (for example, Dodd, 1976; Maggenheim and Mueller, 1987). Brown and da Silva Rosa (1992b) argue that positive pre-bid returns to the bidder is consistent with the hypothesis that differentially efficient firms have abnormally good performance and therefore have surplus funds to invest and see acquisitions as a profitable way to invest those funds.⁶

Brown and da Silva Rosa (1992b) investigate one source of post-acquisition measurement error, namely a benchmark that does not allow for firm-specific size effects. For a size-adjusted benchmark they duly report positive post-bid average returns for a portfolio of bidders. However, as they point out the majority of bidders in their sample actually registered negative returns. Consequently, the positive average returns for the bidder portfolio was actually driven by substantial gains achieved by a minority of bidders. Second, of this minority, a substantial proportion of the bids were ultimately unsuccessful. Accounting for this results in the re-appearance of negative returns. Thus, even a study which attempted to eliminate a so-called measurement error failed to generate results consistent with an efficient market outcome. (The size effect anomaly is dealt with in more detail below.)

Alternative benchmark specifications have also been used to examine the reliability of negative post-acquisition findings. For example, Franks and Harris (1989), Limmack (1991), and Higson and Elliott (1998) all try alternatives to the market model and find variations in their results. On the basis of their CAPM and adjusted-market model results Franks and Harris (1989) conclude that acquirers make modest gains. Higson and Elliott (1998) report similar results, although their findings were sensitive to the choice of sample period. Limmack (1991) finds variation in post-acquisition results depends on whether abnormal returns are equally weighted or value-weighted. From this he concludes that, overall, his results are consistent with post-acquisition losses. Finally, Gregory (1997) used five alternative benchmarks with

⁶ They would also be consistent with the hubris hypothesis, (Roll, 1986) or the free cash flow hypothesis, (Jensen, 1986).

UK data and also concluded that successful bidders suffer significant negative returns.

The negative post-acquisition findings do not not require the abandonment of the efficient markets framework in its entirety. Rather, they suggest that even if the market responds instantaneously to new information and reflects it fully, it would be surprising indeed if all the information necessary to form efficient prices (prices that reflect the full NPV consequences) was available at the time of announcement. Following announcement it seems reasonable to suggest that additional information will be forthcoming warranting a market response. Furthermore, in the cases of successful bids, the post-completion period is also likely to be replete with information about how the acquirer is managing to integrate the assets that have been acquired. Seen in this light, the evidence on post-acquisition returns, *prima facie*, would seem to warrant caution against a claim for announcement period returns capturing the full NPV consequences of acquisitions. Such a claim, it might be argued, requires an unwarranted claim for clairvoyance on the part of the market for corporate control.

2.2 Efficient Markets - the Anomalies Evidence

The preceding arguments represent a critique of the efficient markets paradigm, based on unequivocal conclusions that have sometimes been drawn from results of event studies. In addition, there is also a growing body of empirical research which appears to have uncovered various pricing 'anomalies' in capital markets. This anomalies evidence presents more problems for the orthodoxy of efficient markets.

In the face of the growing 'anomalies' evidence Fisher Black (1986: 533) in his presidential address to the American Finance Association, offered the following revision to the efficient market definition:

"[W]e might define an efficient market as one in which price is within a factor of 2 of value, i.e., the price is more than half of value and less than twice value. The factor of 2 is arbitrary, of course. Intuitively, though, it seems reasonable to me, in the light of sources of uncertainty about value and the strength of the forces tending to cause price to return to value. By this definition, I think almost all markets are efficient almost all of the time. 'Almost all' means at least 90 per cent."

This statement might be thought surprising from one associated closely with the efficient markets framework, particularly in its early days, (Black, Jensen and Scholes, 1972; Black, 1976). However, it is consistent with the study by Summers (1986) who remarks on the extent and frequency with which stock prices diverge from fundamentals. A quantitative interpretation of Black's revised definition is provided by Scherer (1988: 72):

"If Black's estimate represents the 90 per cent confidence bounds about a log normal distribution, for example, then 16 per cent of corporate stocks would be undervalued by 34 per cent or more at any time. Such a distribution of actual prices creates enormous incentives for would-be acquirers who believe that their estimate of true value is more accurate, or based on superior inside information, than the stock market's."⁷

In relation to the market for corporate control, the evidence about excess stock market volatility is of particular interest. The results reported by Shiller (1979, 1981a, 1981b, 1984), Ackley (1983), Summers, (1986) and West (1988ab), all suggest that the likelihood of a considerable lag before the market is able to reflect fully new information and the fundamentals that underpin it. This type of evidence also suggests that focusing on abnormal returns in a narrow event window around announcement is unlikely to capture fully the expected economic consequences of a merger.

2.2.1 A 'Re-interpretation' Response to Anomalies Evidence

One response to the anomalies literature has been to re-formulate hypotheses about how the market receives and responds to information. An example of this work is the so-called *uncertain information hypothesis*, Brown, Harlow and Tinic (1988). This suggests that an information event, such as the announcement of an acquisition bid, produces "noisy" information. Risk-averse investors respond initially by setting prices below the level at which they would be set if investors had full information. As more information becomes available, prices will adjust; these subsequent price changes will be positive, regardless of whether the announcement was regarded initially as either good or bad news. Rao (1992) has argued that the empirical evidence from event studies is generally supportive of this hypothesis, which

⁷ It also, of course, adds weight to the 'hubris' explanation put forward by Roll (1986).

of course rescues investor rationality and efficient markets. However, in the case of mergers and acquisitions, the evidence points to negative drift following announcement. It is difficult to see, therefore, how this sort of re-interpretation helps.

2.2.2 A 'Reformist' Response to Anomalies Evidence

Another response has been to accept the evidence of a stock market anomaly as an empirical fact, and then construct a research design which takes it into account. This does not mean that researchers abandon the efficient markets framework. On the contrary, the implicit assumption is that negative abnormal returns to bidders are due to factors such as measurement error, (Jensen and Ruback, 1983; Franks *et al.*, 1991; Brown and da Silva Rosa, 1992b). The so-called size effect anomaly (referred to above) has been a specific focus of attention and this is examined in some detail.

The size effect anomaly assumes that the market discounts the market capitalisation of a firm when reacting to new information. This could simply reflect economic rationality: smaller (larger) firms produce better economic returns than larger (smaller) ones. On the other hand it could mean that because smaller firms are more likely to be targets, and because targets make substantial gains from bids, the market has already factored bid potential into the price. Or, again, it could be due to both these (and other) factors.

Dimson and Marsh (1986) show that this anomaly causes particular problems when long estimation periods and long event windows are employed.⁸ But they also demonstrate how it is possible to control for the impact of the size effect. Some recent mergers research has proceeded along these lines, (for example, Franks, Harris and Titman, 1991; Brown and da Silva Rosa, 1992b; Agrawal, Jaffe and Mandelker, 1992). The samples used by all these researchers exhibit features reported consistently in the literature. Bidders are drawn from higher size deciles in the population of firms. Targets are more evenly distributed, but tend to be concentrated in the lower size deciles. This, they argue is *prima facie* likely to lead to

⁸ Brown and da Silva Rosa (1992b) point out that the size effect adjustment has very little impact when the event window is drawn narrowly around the bid announcement. This supports the argument from Bradley and Jarrell (1987), that abnormal returns are most reliable in studies with very short event windows.

systematic *downward* bias for bidder returns and *upward* bias in target returns. Without an appropriate adjustment for this size-effect, results generated by the market model would report *normal* bidder performance as negative. After correcting benchmarks for the size effect, the first two studies report results in accord with the size effect hypothesis, with no statistically significant negative post-acquisition drift. In contrast, the study by Agrawal *et al.* (1992) continues to find significant negative performance. Furthermore, they suggest that the results of Franks *et al.* (1991) are sample period specific.⁹

However, the picture could be even more complicated. As Reinganum (1992) points out, the size effect reported in the early 1980s, (Banz, 1981; Reinganum, 1981, 1983), seemed to have disappeared and then reversed itself during the period 1985-90.

Variability in the impact of the size effect over time had already been reported, (Brown, Kleidon and Marsh, 1983). But what Reinganum (1992) reports for the US, in the period 1926-89, is a systematic, cyclical reversal of the size effect, that is both statistically and economically significant. These results have a resonance with the overreaction effect reported by De Bondt and Thaler (1985), who find that returns performance in one three-year period helps to predict performance in the next three-year period. Poor performance tends systematically to be followed by abnormally good performance. Fama and French (1988) also find negative autocorrelation in stock prices over the long-run. Therefore, researchers who point to the size effect to explain negative post-acquisition returns cannot rely on this anomaly for a complete explanation.¹⁰

As Brown and da Silva Rosa (1992b: 6) point out, we do not yet understand the cause(s) of the size effect anomaly. In addition to the size effect, other 'anomalies' have been reported. For example, empirical tests of CAPM by Litzenberger and Ramaswamy (1979) found that

⁹ The studies by Agrawal *et al.* (1992) and Brown and da Silva Rosa (1992b) focus their attention solely on the size effect. In contrast Franks *et al.* (1991) have a benchmark portfolio which is constructed with portfolios based on both dividend yield and past returns, as well as portfolios based on firm size.

¹⁰ This is a point made by Brown and da Silva Rosa (1992b), even though their results support the need to adjust for the size effect.

higher rates of return are required for firms with higher dividend pay-out ratios. Furthermore, Basu (1977) found that firms with low price-earnings ratios have higher than expected returns. The list of cross-sectional and time series anomalies with respect to stock market efficiency is now quite extensive and continues to grow.

Anomalous results, of themselves, do not prove that the market is inefficient. Such results might indicate inefficiency, or the lack of a correct equilibrium asset pricing model, or both. Whilst a failure to reject the null hypothesis of market efficiency does not *per se* prove its validity, (Summers, 1986), so too the corresponding statistical results in the anomalies literature do not prove that the market is inefficient. The point of this brief discussion is merely to point up, once again, the potential dangers of using results from event studies as the sole measure of the economic success (failure) of mergers and acquisitions, even when account has been taken of so-called anomalies.

2.3 Which Market is Efficient?

It is also possible to advance a third critique of the market efficiency paradigm as it is applied to mergers and acquisitions research. This concerns the issue of market definition. Fama (1991) uses the results from the mergers research literature to support the proposition of market efficiency. However, most empirical tests of the EMH have been conducted on secondary stock market data, not on the market for corporate control. But, as Shubik (1987: 41) argues, trading volumes in the secondary market and the takeover market are very different.¹¹ In the former, even at very high volumes, trading is but for a very small fraction of a firm's shares. In the latter, on the other hand, trading is for the contemporaneous sale and purchase of all of a target's equity. Second, the market structure of the secondary market might approximate the conditions for a perfectly competitive market, but in the takeover market, even in the case of contested bids, this is most unlikely.¹²

¹¹ In a different context, Keane (1983, p.12) also argues that for analytical purposes it can be useful to divide the stock market up into sub-markets. He is clear that pricing efficiency in stock markets needs to be thought of in two distinct circumstances: trading in securities on the one hand, and trading on new information on the other.

¹² However, if the takeover market could be characterised as *contestable*, then competitive prices might pertain. For example, in takeovers battles involving multiple bidders the takeover premium would usually be higher.

Empirical evidence from the efficient markets literature does suggest that, despite similarities, there are indeed distinct sectors or sub-markets in a stock market. For example, evidence from the new issue market suggests systematic under-pricing inconsistent with the efficient markets hypothesis, (Ibbotson, 1975; Rock, 1986; Masulis and Korwar, 1986; Jenkinson and Ljungqvist, 1996). Similar results have been found to obtain in the market for rights issues, (Marsh, 1979; Mikkelsen and Partch, 1986; Asquith and Mullins, 1986). Both sets of results suggest that, when investigating market efficiency, it is important to delineate specific sectors or sub-markets very carefully.

There are a number of features of both the new issue and rights markets which have institutional characteristics not dissimilar from the market for corporate control. First, there is a large volume of securities traded. Second, the reputation of the management teams involved is a particularly important factor in determining market response. Third, each situation is likely to represent a significant investment opportunity, with greater uncertainty involved than investors usually confront in secondary market trades. If this line of reasoning is correct, then the evidence from the new issue and rights markets might be used (tentatively) to make inferences about efficiency in the market for corporate control. That evidence is, at best, only consistent with partial market efficiency. In the new issue and rights markets, the empirical evidence confirms a rapid price response to new information, thereby fulfilling one of the requirements of an efficient market. But in each case there is substantial price correction or re-adjustment in the period following announcement, which clearly violates the second condition for market efficiency.

Given that there is not an exact correspondence between these two sub-markets and the market for corporate control, these arguments can, perhaps, only be thought indicative. Following the argument used at the end of the last section, clearly evidence of inefficiency in one sub-market or sector does not necessarily imply inefficiency in another. Nevertheless, evidence from the new issues and rights markets does suggest, once again, that circumspection is required when using abnormal returns at announcement as the sole metric of the economic consequences that flow from mergers.

2.4 Event Study Research Design and Methodology

The review of the empirical evidence in Chapter 2, and the discussion above, demonstrate clearly the inconsistent nature of the results which have been obtained. This lack of empirical consistency makes it difficult to reach definitive conclusions about the impact that mergers and acquisitions have on the wealth of shareholders of acquiring firms. *A fortiori*, it is impossible to reach any meaningful conclusions about the impact that these transactions have on economic or productive efficiency.

One factor which contributes to this state of affairs is the lack of consistency in the research design employed in the event studies reviewed. In attempting to control for problems to do with benchmarks, etc., modifications have often been made to research designs, making comparisons between studies of different vintage even more difficult. Some of these issues are outlined briefly below and are discussed in more detail in Chapter 4.

The length of the estimation period and the gap between estimation period and announcement has been shown to be an important determinant of the size and significance of the abnormal returns reported, (Maggenheim and Mueller, 1988; Bradley and Jarrell, 1988; Holland and Hodgkinson, 1992). Similarly, the length of the event window can have an important impact, (Maggenheim and Mueller, 1988; Bradley and Jarrell, 1988; Limmack, 1991). In a study which examined these specific issues, Connell and Conn (1993) provide evidence to suggest that the alpha and beta coefficients of the estimated market model are subject to shifts which are likely to bias event study results.

The sample size and sample period has also been shown to be a factor in the results reported, (Jarrell and Poulsen, 1987; Agrawal, Jaffe and Mandelker, 1992). As already mentioned above, there is also a substantial amount of evidence to suggest that results can also be sensitive to the benchmark model chosen to compute the abnormal returns, (Franks, Harris and Mayer, 1988; Franks and Harris, 1989; Lahey and Conn, 1990; Limmack, 1991).

Within the empirical literature, various event studies have also shown that the inclusion of firm-specific and transactions-specific factors can influence results; although other studies

have suggested that these factors are not important. Explanatory variables include: firm size (Dimson and Marsh, 1986; Franks, Harris and Titman, 1991; Agrawal, Jaffe and Mandelker, 1992); terms of payment (Travlos, 1987; Hansen, 1987; Amihud, Lev and Travlos, 1990; Salami, 1992); the distinction between conglomerate and other types of integration, (Jensen, 1986); the mood of a takeover bid, i.e. hostile/friendly, (Huang and Walker, 1987; Lubatkin, 1983); whether a bid is contested or not, (Bradley *et al.*, 1988; Kummer and Hoffmeister, 1978).

As this brief review demonstrates, during the past fifteen years or so, the only constant factor in research design has been the continued use of the event study. The increasing level of sophistication employed has certainly provided new insights into the mergers and acquisitions phenomenon, but at the cost of making comparisons between research studies increasingly difficult. This factor, too, suggests caution is required when drawing conclusions from the extensive body of research which has employed the event study methodology.

2.5 Conclusions about the Event Study Methodology

On the basis of the arguments advanced above, it seems reasonable at least to question the extent to which share price returns can be relied on to provide an accurate measure of the economic gains (losses) that result from acquisitions activity. As Keane (1983: 37) points out:

"Reaction must not only be rapid, it must be in the right direction and of the right magnitude. Speed is usually, though not always, relatively easy to measure. It is the other aspects that present the problems."

Clearly, when using the abnormal returns metric, the measurement problem alluded to by Keane is exacerbated by the need for a definition of market efficiency that requires prices to represent the present value of future cash flows consequences from M&A activity. Generally, the efficient markets literature does not require such an exacting definition. In that literature, "The essence of a correct price is not that it predicts the future, but that it fully captures the uncertainties of the future." Keane (1983: 18).

What this means is that, in order to be "correct", the price of a security at t_0 has only to be a

fair representation of the probabilities of the states of the world as they are likely to impact on a firm's cash flows, given the information set available at t_0 . For efficiency in this sense does not require that the price response to a merger announcement is an accurate prediction of the eventual economic outcome of the merger. If all that is required of market efficiency is the condition that no-one can use public information to "beat the market", then Keane's definition of a correct price is probably adequate. But if attempting to use share-price returns as an *ex-post* measure of the gains (losses) that result from mergers and acquisitions, then such a definition is clearly inadequate. It is not informational efficiency at the time of the bid which is of most concern, it is the subsequent outcome.

Start from the not unreasonable assumption that all hypotheses of merger activity posit either a beneficial or net zero outcome for the acquiring firm. Also disregard whether such benefits are produced by unknown synergies, removal of inefficient management, or the achievement of market power. Then, the question is how to obtain a direct measure of those benefits, *ex post*. Given the arguments outlined above, it is clear that abnormal returns at announcement can, at best, provide only an indirect measure of improved economic performance. This argument is summarised by Healy, Palepu and Ruback (1992: 135-6):

‘... research is motivated by the inability of stock price performance studies to determine whether takeovers create real economic gains and to identify the sources of such gains. ...From the stock price perspective, the anticipation of real economic gains is observationally equivalent to market mis-pricing. It is therefore difficult to conceive of a pure stock price study that could resolve the ambiguity in the evidence.’

Another perspective on the adequacy of abnormal returns measured at announcement is provided by Roll (1987: 243):

‘The announcement of a takeover bid discloses at least two pieces of information: first that the takeover will be attempted, and second, that the internal affairs of the bidding firm are such that a takeover bid is possible ... The problem is that the bid is a "polluted" information item. ... Therefore it might take time to resolve the full market reaction.’

The point of this critique of the event study methodology, and the efficient markets paradigm on which it depends, has not been to suggest that the methodology is so flawed that it should

be abandoned. The point, rather, has been to highlight and emphasise the difficulty of using this methodology in isolation. There is clear evidence to suggest that the interpretation of event study results is so closely bound up with the assumption of market efficiency, that market model abnormal returns at announcement are most unlikely to provide a completely reliable measure of subsequent economic performance.¹³

By the same token, the purpose here is not to question the concept of market efficiency as such. Rather, it is to argue that even if the market is efficient - that is, that prices respond instantaneously to new information and fully reflect it - it would be surprising indeed if all the information necessary to form a definitive price for the economic consequences of any given merger were to be available at the time of announcement or shortly thereafter. For, in order to realise all the potential economic gains from an acquisition, the acquiring management team must operationalise pre-bid strategies and plans. But, as studies from Kitching (1967) onwards have shown, post-acquisition action does not always live up to pre-bid intentions. Therefore, when the market learns about the dismissal or quits of target managers, or re-structuring of acquired assets, or when it judges anticipated re-structuring has not taken place, it would be surprising if price revisions did not occur. Indeed, such revisions would be necessary if the market was to reflect fully the economic consequences of an acquisition.

If these arguments are accepted, then it would seem sensible to seek corroboration for the event study evidence via the use of alternative approaches. Following the contributions of Bradley (1987), Higson (1991), Healy, Palepu and Ruback (1992), and Manson et al. (1993), the obvious data to utilise in this attempt at corroboration would be the published accounting data produced by the firms involved. As these authors point out, there have been very few attempts to apply different methodologies to the same data set (to date only one, small scale study with UK data). Therefore, the methodological issues involved with accounting studies are examined next.

¹³ It is interesting to note that, in a survey of perceptions on market efficiency, Ashton, Crossland and Moizer (1992) find that UK market analysts and fund managers are considerably more sceptical of semi-strong efficiency than company directors.

3. THE USE OF ACCOUNTING DATA

There have been three basic methodological approaches to the use of accounting data. First, the search for systematic differences in the pre-bid performances of targets and bidders, via various forms of discriminant analysis. Second, the comparison of pre-bid performances of targets and bidders versus the post-acquisition performance of the combined firms. Third, detailed case studies, involving the use of both qualitative and quantitative accounting data.

In the main, all three methodologies have been used to test various versions of the management displacement hypothesis. As a research medium, accounting data has a number of advantages compared to share price data. In particular, it offers the potential to employ direct tests of the disciplinary and synergies hypotheses. In contrast, event studies with share price data only ever afford indirect tests, that depend on the critical assumptions of efficient markets and efficient benchmarks. With accounting data it is possible to examine the pre-bid performances of targets and bidders and to test whether it is the case that the efficient take over the inefficient. Also with accounting data there is greater scope to test for and locate synergistic impacts of mergers and acquisitions. For example accounting data allows researchers to examine the impacts on asset productivity in a way that is simply not possible with share-price returns.

However, due to distortion, bias, etc., the use of accounting data can be problematic. In addition, when looking at post-merger performance there are two other problems. First, there is the issue of the counterfactual: the real, but unanswerable question should be about what performance might have occurred in the absence of a takeover? Second, the possibility of changes in market power as a result of takeover means that inferences that can be drawn about efficiency effects are limited. If accounting profitability increases post-acquisition, this could be due to increases in market power, increases in productive efficiency, or both, and disentangling them in anything other than a case study is exceedingly difficult, (Cubbin and Hall, 1979; Meeks and Meeks, 1981).

A useful and succinct way of comparing the share price and accounting methodologies is to

consider tests of the management displacement hypothesis. In the case of accounting studies, the test is direct and allows for clear inferences to be drawn, but the data is tainted with potential bias and distortion. In the case of share price data, the reverse is the case: the data is clean¹⁴, but the test is indirect and tainted with potential bias and measurement error.

The major issues and problems associated with the use of accounting data are now examined below.

3.1 Distortion due to UK Accounting Regulation & Practice

In the UK, accounting policy conventions and regulations have had an important impact on the post-combination profitability reported, particularly in the first post-merger year, (Appleyard, 1980; Sudarsanam, 1995; Chatterjee and Meeks, 1996). For example, Appleyard (1980) has demonstrated how the choice of accounting treatment of a merger or acquisition can have a significant impact on the post-combination accounting rate of return (ARR) and earnings per share (EPS). Until recently, there was considerable discretion allowed to acquiring firms about which of two accounting methods they could use to account for the transaction.¹⁵ The two methods are acquisition accounting and merger accounting and they can have very different impacts on post-combination profits and profitability.¹⁶

Under merger accounting goodwill is not recognised and does not have to be written-off, allowing the 'parent' to recognise all the profits earned by the acquired firm from the start of its financial year. In the case of the acquisition accounting method, any goodwill arising as the result of an acquisition has to be written-off against the acquirer's profits or revenue reserves. This will clearly have an adverse impact on ARR and EPS. Furthermore, under this

¹⁴ Except, perhaps, for the problem of thin trading, (discussed in considerable detail in chapter 4).

¹⁵ Since the introduction of *Financial Reporting Standards* 6 and 7, in 1994, the discretion that company managements have to manipulate the method of accounting for a merger or an acquisition has been greatly curtailed. This has been due to a more rigorous definition of what constitutes a merger and making merger accounting mandatory.

¹⁶ Merger accounting had been used infrequently prior to 1981, due to doubts about its legality in cases of acquisition. In that year the *Shearer v Bercaim* case outlawed merger accounting in situations that could not be shown to be true mergers, (Rutteman, 1987).

method the acquirer can only show that proportion of the acquired firm's profits earned since the date of acquisition. At face value, it would appear that acquirers would prefer merger accounting and have incentives to adopt this method, (Appleyard, 1980; Salami, 1992).

However, under provision of section 131, Companies Act 1984,¹⁷ acquiring firms were allowed to use the acquisition method and claim "merger relief". This allows for the creation of a "merger reserve account" against which goodwill may be written-off. Despite the legislative intention that merger relief should only be used with merger accounting, it has in practice been applied most frequently in cases of acquisition accounting, (Rutteman, 1987). The result has been that acquirers have been able to show dramatic increases in post-acquisition profitability and EPS.¹⁸ Furthermore, Statement of Standard Accounting Practice (SSAP) 22 allowed acquirers to anticipate future trading losses of the acquired firm, plus reorganisation costs due to the acquisition, based only on the acquirer's subjective judgement. As Sudarsanam (1995) points out this has allowed acquirers to manipulate future reported profits,¹⁹ in addition to claiming the benefits of merger relief.

Many accounting researchers, (for example, Paterson, 1988; Sharp, 1988; Woolf, 1988;) have argued that merger relief, combined with SSAP 22 and 23, seriously distorted post-acquisition profits reported since the provisions of the 1984 Act. These views have received corroboration from the findings of Chatterjee and Meeks (1996), who demonstrate the distortion with a systematic study of UK acquisitions over the period 1977-90. Paterson (1988: 43) summarises the impact that the merger relief provision has had in the following way:

"... [it] allows predators excessive latitude to demonstrate the success of their

¹⁷ The merger relief provision in s. 131 was an example of retrospective legislation, introduced after lobbying by acquisitive firms which had used merger accounting prior *Shearer v Bercain*, in 1981, (Rutteman, 1987).

¹⁸ Rutteman (1987) gives a number of examples where the use of merger relief and acquisition accounting clearly distorted the headline transaction price in the accounts of the acquirer; £256m versus £627m in the case of the Burton Group take-over of Debenhams, and £1,161m versus £2,695m in the case of Guinness' takeover of Distillers.

¹⁹ These losses and costs will have the effect of reducing future depreciation charges, thus increasing reported profits.

takeovers by putting the most favourable gloss on subsequent results of the enlarged group."²⁰

The existence of these different accounting treatments clearly introduces possibilities of cross-sectional bias in the accounting data. It would require considerable effort to remove this bias, particularly in large samples. Even before the introduction of merger relief in 1984, Appleyard (1980: 551) argued that, 'accounting measures are unreliable as measures of economic performance in merged firms'. Following the 1984 provisions, Chatterjee and Meeks (1996:866) conclude that, "... satisfactory results on the underlying profitability effects of takeover may never be achieved for the 1984-94 accounting regime".

3.2 The Problem of the Counter-factual

In the case of post-merger profitability research, one obvious problem concerns the counter-factual question: what would have happened to the performance of the two separate firms if the merger had not taken place? Although it is not possible to answer this question directly, researchers have used a number of proxy benchmarks. Typically researchers have used either an industry or size control group, or comparison against the joint, pre-acquisition profitability record of the acquired and acquiring firms. The extent to which these proxies are correlated with the counter-factual will determine the accuracy of the results.

Large, modern firms, even if they are located mainly in one industry or sector, may still be very different one from another. Therefore, the use of control groups of firms is likely to be problematic. However, use of industry or sector controls at least have the merit of being comparators used by investors to judge performance of targets and bidders prior to bid announcement. The alternative, using the pre-merger performances of the merging firms is probably more unsatisfactory because trading conditions obviously change over time. Depending on the industry(s) in which the target and bidder firms operate, and the timing and

²⁰ Furthermore, Rutteman (1987) explains how the terms of a bid can be affected in favour of shares by an incentive offered under the merger relief provision. Take-over advisers (such as merchant banks) offered acquirers a series of invented and thinly veiled schemes whereby they could actually use cash to pay for the acquisition, but appear to be offering a share exchange. This proved necessary because the legislation requires that in order to qualify as a merger 90 per cent of the consideration must be in the form of the acquirer's equity. These schemes allowed acquirers to obtain the benefits of the merger relief.

amplitude of the business cycle, the difference between pre and post-merger profitability could be very different without necessarily indicating that productive efficiency had either improved or deteriorated.

In the light of the counter-factual problem, it is likely that using financial characteristics to discriminate between targets and bidders is a more reliable research strategy than attempting to measure post-acquisition performance.

3.3 Biases in Published Accounting Data

In addition to the problems of bias from the different methods of accounting for merger transactions and the problem of the counter-factual, the historic cost convention and the accruals concept give rise to other difficulties when using accounting data. Some examples of those difficulties are reviewed below.

Ratios of profits (earnings) to sales are obvious measures of profitability for researchers to use. At face value, sales revenue appears to be the least problematic of all the accounting numbers. There is less opportunity to make subjective judgments about sales than many other accounting categories. However, Meeks and Meeks (1981), demonstrate that if merging firms had mutual sales prior to the merger, or had sales with third parties prior to the merger which were subsequently replaced by an internal transaction post-merger, then the denominator in the profit/sales ratio would be biased downwards. The result would be, therefore, an upward bias in this measure of profitability.

The extent to which bidders and targets trade pre-merger, or replace third party trade with an internal transaction post-merger is, of course, an empirical matter. As a result, it is not possible to say *a priori* how much of a problem this potential for bias represents. It is clear that the potential is at its greatest in the case of vertical conglomerate integration, although it cannot be ruled out in the case of horizontal merger either. For example, if one firm was more vertically integrated than the other, then internal post-merger trade might well be one of the benefits which provided the rationale for the merger.

The *rate of return on equity* could perhaps, be considered the closest analogy or articulation between accounting data and share-price data. However, a bias due to financial gearing, identified by Meeks and Meeks (1981) suggests that this ratio needs to be treated with caution if it is to be used as a measure of performance improvement. Meeks and Meeks (1981) show that return on equity is an increasing function of gearing, and that it is, therefore, possible for the return on equity measure to change simply as a result of a change in gearing brought about by the merger transaction. If return on equity is utilised as an efficiency measure, it could be subject to bias, because it would be possible for productive efficiency to have actually declined post-merger, but the return on equity to have increased due to changes in gearing. One possible way of dealing with this problem would be to substitute the return on capital, but that too is not without its problems.

In the case of the *ratio of profit to total net assets*, another popular measure in accounting studies, (Singh, 1971; Meeks, 1977; Utton, 1974), bias can arise in two ways. First, by not having the opening asset balance of the acquired firm in the denominator, an upward bias results in the profit/net assets ratio. Second, bias is introduced by the amount of the acquired firm's profit which the acquiring firm is allowed to claim in the year of the acquisition, (Meeks and Meeks, 1981).

The latter cause of bias or distortion is potentially the more problematic, because, as Meeks and Meeks (1981) show, it is not clear, *a priori*, in which direction the bias will operate. Nevertheless, they quote evidence from Meeks (1977) which suggests that, given the size differential between acquired and acquiring firms, the bias is likely to operate in an upward direction.

A final distortionary bias due to accounting practice occurs on consolidation of the acquired firm's assets by the acquiring firm, Meeks and Meeks (1981). Starting from the assumption that the price paid is greater than the asset value of the acquired firm, then it is likely that the acquired assets will be recorded at a higher figure in the books of the acquiring firm. Therefore, any return on assets measure will be biased downward post-merger. But, as seen above, the choice of accounting method and the provision of merger relief has complicated

matters considerably and made analytical treatments of bias weaker.

3.4 Sample Selection Bias

The problem of bias introduced by sample selection is, of course, not unique to the accounting methodology. However, it might be more severe in ex-post profit studies, than studies based on the examination of pre-bid financial characteristics and event studies. In seeking a sample in which the firms in the sample are not involved in mergers for a significant period prior to the merger event under study, sample bias can be introduced. Depending on the length of the 'sterilisation' period, the requirement for 'clean' data might mean that sample firms are infrequent acquirers. This, in turn, means that they are less likely to be practised at managing takeovers and, *ceteris paribus*, less likely to show performance improvements. With the ex-post profit methodology this problem is exacerbated by extending the sterilisation period after the takeover has been completed.

There is some evidence on the relative performance of less experienced acquirers. In an event study based on Australian data, Brown and Da Silva Rosa (1992a) found that less frequent acquirers had a lower chance of achieving positive returns than the more frequent acquirers in their sample. In contrast, Hunt (1988) presents UK evidence which suggests that previous acquisitions experience was not a significant factor in determining the ultimate success or failure of a merger or acquisition.

3.5 Implications of Distortionary Bias

The problems outlined above have led Meeks and Meeks (1981: 342) to conclude that, "... the likely direction of the distortions remaining is clear: post-merger profitability observations will on average be overstatements." Thus, they suggest that any inferences about changes post-acquisition productive efficiency will necessarily be highly problematic, (see also Cubbin and Hall, 1979). In particular, any profitability improvement cannot be claimed as evidence for increased efficiency. In fact, given the expected upward bias, any increase in post-acquisition profitability, could be equally consistent with a decline in productive efficiency. However, if post-acquisition profitability declines or is unchanged, then the expected direction of bias would point to an fall in productive efficiency.

If the arguments from Meeks and Meeks (1981) are correct, then it means that profitability measures, on a conventional accruals basis, could not demonstrate improvements in efficiency due to merger and acquisitions, only declines. Such an asymmetry is clearly a considerable deficiency in any performance measure. However, even if it were technically feasible, to remove distortions and bias from sample accounting data, with a large data set that is likely to be a task beyond the resources of most research projects.

Alternative measures based on accounting data have been suggested: for example, labour productivity and the Farrell concept of 'real cost' suggested by Cubbin and Hall (1979).²¹ However, once again the data requirements and resources are such as to rule these out for large scale samples. Only published data affords the opportunity for research on a large scale, which would seem to preclude, therefore, the ex-post research methodology as a way of reconciling share price and accounting data methodologies.²²

Finally, another issue to be considered in any research design concerns the statistical properties of accounting data. For example, in their attempt to reconcile results between share price and accounting data, Brown and Da Silva Rosa (1992a) note the problems due to 'extreme noise' in accounting data.

3.6 Cash Flow Measures

An alternative to accounting data based on accruals is the use of cash flow data. This has the ostensible advantage of avoiding the biases induced by the accruals concepts and conventions. It also has the advantage of having a more obvious correspondence with share price data, given that, theoretically, share prices are meant to reflect expected future cash flows.

As an objective of the present study is to reconcile the empirical results derived from share

²¹ Cubbin and Hall (1979) analyse in some detail the difficulties with labour productivity measures and, on the basis of this analysis, reject changes in labour productivity as a feasible measure.

²² In fact Chatterjee and Meeks (1996) are rather more hopeful. They conclude that with the changes in accounting regulation introduced with FRS 7 in 1994, it might in future be possible to use published post-acquisition accounting data with more confidence.

price data and accounting data, the use of cash flow data might appear to be a way forward. However, some contributions to the finance literature, (Lawson, 1980, 1981), would suggest that such a strategy is not entirely unproblematic. Empirical research into the relative information content of accounting data versus cash flows has not yet resolved which carries the stronger signal to the market, nor has it resolved which set of measures is the most efficient predictor of future cash flows.

Early US studies, (Ball and Brown, 1968; Beaver and Dukes, 1972; Patell and Kaplan, 1977), have reported that accrual earnings are more highly associated with abnormal returns. Unfortunately, these studies employ different and questionable cash flow surrogates, making comparisons between them difficult, (Beaver, 1989).

Without the full set of accounting records it is not possible to produce cash flow data by the 'direct method',²³ that is a true record of cash flows into and out of a business. Instead cash flow data has to be constructed via the indirect method from published accruals data. The cash flow literature suggests two ways of implementing this indirect method, often referred to as 'traditional' adjustments and 'alternative' adjustments. Broadly, the first method consists simply of operating income, with an adjustment for depreciation. The second method requires the traditional adjustment, plus depreciation, plus a further adjustment for the cash flow effects of working capital.

There can be large discrepancies between periodic cash flows and accounting counterparts. Theoretically, when cash flow and accounting profit series are both aggregated over the full life of a single project, they will be identical in nominal terms, (obviously not in present value terms). However, for practical reasons such as taxation and depreciation, this is unlikely ever to be the case. This is exemplified by an *ad hoc* US sample in Table 3.1, with the correlation between them a mere 0.09.

²³ Even recent regulation does not require UK companies to report cash flows via the direct method.

Table 3.1

A Comparison of Changes in Reported Net Profit and Changes in the Underlying Cash Flows, (calculated via Adjustments that include Changes in Working Capital).

	Cash Flow % change 1986-87	Net Profit % change 1986-87
Exxon	45.4	-9.7
IBM	-26.1	9.8
Ford Motor	8.5	40.8
American Telephone & Telegraph	-6.1	551.0
Texaco	44.9	nm
Chevron	-2.9	40.8
General Electric	44.2	-15.0
Du Pont (E.I.)	9.8	16.1
Atlantic Richfield	224.0	99.0
Amoco	41.7	82.1
GTE	-1.2	-5.5
Bellsouth	-12.2	4.8
RJR Nabisco	21.7	0.1
Mobil	-15.3	-10.6
Bell Atlantic	-2.3	6.3
NYMEX	-7.2	5.0
American Information Technologies	-14.2	4.4
Phillip Morris	17.8	24.6
Chrysler	9.4	-8.1
US West	-1.1	8.8

Source: Rao (1992) Original Source: *Business Month* Jul-Aug 1988.

Lawson (1980, 1981) has compared the performance of major UK listed firms in cash flow and accruals terms, for a period of 23 years. His findings suggest that the use of historic cost accounting data have lead many of these firms to pay dividends out of capital, and for the government to tax the corporate sector far too heavily. Nevertheless, he judges that the capital market was able to glean the underlying cash flow performances of these companies from their historic cost accounting data and to adjust share prices accordingly.

The relationship between cash flow ratios and accounting ratios has been investigated in the

US by Gombola and Ketz (1983). They note that earlier studies typically used the traditional adjustment for cash flow ratios, which they demonstrate is technically incorrect, (confirmed by Lawson, 1985). As a result of this error, earlier studies generally found a high correlation between these traditional cash flow ratios and their equivalent accounting ratios. Using cash flow ratios adjusted on the alternative basis, '... cash receipts from operations less cash disbursements for operations', Gombola and Ketz (1983: 106), they find that cash flow ratios may have additional information not found in accruals ratios.

These results are confirmed by Bowen, Burgstahler and Daley (1986), who also find that traditional derivations of cash flows are highly correlated with earnings, but that alternative, and more meaningful cash measures are not. They also find that these traditional cash flows are better predictors of future cash flows than earnings data. In Bowen, Burgstahler and Daley (1987), they extended their earlier work to look at the association between accounting performance measures and abnormal returns. Using alternative cash flow measures, they find that cash flows contain information not contained in accounting data, but also that the latter contains information not contained in cash flows.

In the UK, Board and Day (1989) find evidence for information content in the accounting return on investment ratio and also in a corresponding cash flow analogue, constructed via the alternative adjustment. However, they do not find information content in net cash earnings. Subsequently, Board, Day and Walker (1989) replicated these results for the cash earnings measure with both UK and USA data, although Arnold and Wearing (1991) doubt the reliability of their cash flow measure.

From this brief review of the literature on cash flows and information content, it seems that the adoption of cash flows can obviate some of the difficulties experienced with accruals data. Nevertheless, the construction of synthetic cash flows from published accounting data is not without difficulties. Furthermore, it is still not clear from the literature whether theoretically correct cash flow measures are more reliable predictors of expected future cash flows. Finally, it is not clear that cash flow measures are the preferred decision making data employed by the management teams that engage in mergers and acquisitions. Indeed, the earlier review about

management choices of accounting method and the use (abuse?) of 'merger relief', would suggest that management teams place considerable store on the accounting results they publish and on the likely stock market reaction to those results. This accords with a substantial body of research which confirms the importance of accounting data for decisions in both the corporate and market spheres, (Whittington, 1979, 1988; Luckett, 1984; Foster, 1986; Kelly and Tippet, 1991; Brief and Lawson, 1991; Breton, Cucumel, and Taffler, 1993).²⁴

4. SUMMARY AND CONCLUDING REMARKS

This chapter has presented a review and critique of research methodologies applied to mergers and acquisition. The advantages and drawbacks of the event study approach favoured by financial economists were contrasted with the methodologies applied by industrial economists using accounting data.

4.1 Event Study Methodology

This part of the review began with an analysis of the role played by the efficient market hypothesis. The assumption of stock market efficiency was shown to be a crucial component, both in terms of research design and in the subsequent interpretation of results. A number of important definitional issues were examined, together with a review of the evidence on market efficiency.

²⁴ For example, Breton *et al.* (1993), in their study of information used by financial analysts, find that accounting data play an important role. However, they also cite previous studies which suggest that analysts tend to use accounting data for corroborative purposes only.

In 1993, the UK Accounting Standards Board introduced FRS3 requiring companies to change the ways in which they constructed and presented their published accounts. Corporate management teams from FT-SE 100 companies, (for example, Fisons, Inchcape, TI, RTZ, Reckitt & Coleman, and Unigate), were so concerned about the way these new accounting data might be interpreted by the financial community that they chose to provide pre-FRS3 comparisons, including earnings per share, in addition to the FRS3 requirements. Financial analysts also went to the trouble of "giving clients a 'normalised' figure [for earnings per share] based on a formula suggested by the analysts' trade body". (*The Observer*, 11 July 1993).

Such evidence is at least suggestive of the importance that managers and the financial community place on accounting data, despite the problems of potential bias and distortion. (For an alternative and diametrically opposed point of view, which argues for the irrelevance of accounting data, see Stewart, 1990).

Whilst the semi-strong version of the EMH has been incorporated generally, (sometimes implicitly), into event study research programmes, the subtle shift in the precise definition of semi-strong efficiency was highlighted. In its early manifestations the semi-strong EMH required that stock prices respond rapidly and *fully reflected* new information, such as a takeover announcement, (Fama, 1970, 1976). More recently, the requirement for new information to be fully reflected has been elided from the efficient markets literature and replaced by speed of response, (Fama, 1991). However, given that abnormal returns are used as the only measure of the value enhancing (decreasing) impact of mergers and acquisitions, the requirement for stock price reactions to incorporate fully the present value consequences of takeovers is inescapable. Market efficiency in this sense is a more exacting definition than price setting such that no agent can 'beat the market' on a systematic basis, (Keane, 1983).

A second issue concerns the definition or segmentation of the market under examination. In particular, the trading volumes associated with different segments of the market vary in form and substance, (Shubik, 1987). While most of the research focuses on the secondary market for shares, evidence from the markets on initial public offerings and for rights issues suggests systematic divergence from the expectations of an efficient market. It was argued that these two market segments have certain features that are similar with the market for corporate control, that make it different from the secondary market.

The empirical research on efficiency suffers from a number of deficiencies such as the dual hypothesis problem and the specification of an appropriate proxy for the market portfolio, (Roll, 1977; Fama, 1991). As a result, much of that research has been based on the market model. This model has the drawback of not being as theoretically well grounded as the CAPM, but the advantage of not being based on an assumption of stock market efficiency, (Fama, 1991).

In the literature, much reliance has been placed on the ability of event studies to generate empirical regularities capable of replication, (Fama, 1991). However, one regular feature of the M&A literature has been the negative drift in post-acquisition returns, and this has been recognised as inconsistent with market efficiency, (Jensen and Ruback, 1983). This evidence,

together with other 'anomalous' evidence on market efficiency, (for example, Shiller, 1979, 1981a, 1981b; Summers, 1986), has focussed attention on benchmark specification. While some of the resultant research studies have produced results consistent with market efficiency, (Franks and Harris, 1989; Franks *et al.*, 1991), other studies simply confirm the previous 'anomalous' findings, (Gregory, 1997). One aspect of the extant research literature that makes it difficult to compare the different studies is the variability in research design. Changes in research design, such as benchmark specification and length of estimation and event windows, can have a material impact on the results reported, (Maggenheim and Mueller, 1988; Bradley and Jarrell, 1988). Furthermore, there is evidence to suggest that results can also be affected by sample size and by the date of acquisition, (Herman and Lowenstein, 1987; Bradley *et al.*, 1988; Jarrell *et al.*, 1988; Limmack, 1991).

4.2 The Use of Accounting Data

Three methodological approaches have been adopted with accounting data. Financial ratios have been used to discriminate between acquired and acquiring firms in order to highlight the characteristics of each group, with a view to testing the disciplinary hypothesis - that is, whether more efficient management teams displace the less efficient. Second, the comparison of pre-acquisition and post-acquisition performance to discover whether takeovers improve profitability and productivity. Finally, the case study methodology has also been used to analyse the sources of post-acquisition changes in performance.

While the use of accounting data provides the potential to address these questions directly, (unlike the event study methodology which provides only an indirect test), the data itself is vulnerable to distortion and bias. The types and sources of some of the main distortions and biases were examined in turn. In 1984, changes to UK company law and accounting regulation provided acquiring firms with opportunities to adopt accounting practices which tended to distort post-acquisition earnings, (Paterson, 1988; Chatterjee and Meeks, 1996). An unintended consequence of these changes was to allow acquirers to adopt acquisition accounting, but to take advantage of a 'relief' that was only meant to apply to merger accounting. These changes also tended to influence the way in which acquisition bids were structured and financed, (Rutteman, 1987). As a result, Chatterjee and Meeks (1996) argue

that making comparisons of pre-acquisition and post-acquisition accounting during the period 1984-94 was rendered meaningless. Even prior to the 1984 changes, the use of merger and *acquisition accounting made such comparisons difficult*, (Meeks and Meeks, 1981).

In addition to the distortion introduced by changes in legislative and regulatory provisions, accounting concepts and conventions mean that published accounting data can bias pre-acquisition and post-acquisition comparisons. A number of the more important biases were examined, as were the issues of sample selection bias and the problem of the counterfactual.

The use of cash flows would, in theory, remove many of the distortions and biases induced by accruals data. However, the only practicable way to arrive at these flows is to adjust published accruals data, and this re-introduces the possibility of distortion and bias. Furthermore, while cash flow data is conceptually more consistent with the theory of share prices formation, it is not yet clear whether current accruals or cash flows provide the best market predictor of *future* cash flows, which is of concern in assessing the benefits of an acquisition, (Bowen *et al.*, 1987; Board and Day, 1989).

4.3 Conclusions

This chapter has demonstrated a number of more or less serious deficiencies and drawbacks in the use of both share price and accounting data. Both have advantages and disadvantages relative to one another. While share prices can be regarded as clean data, the event study methodology only provides opportunities for indirect tests of the management displacement hypothesis. Critically, it is also reliant on a strong assumption of stock market efficiency.

In contrast, accounting data is far less reliable, but the methodologies that employ it offer direct tests of disciplinary and synergy hypotheses. Furthermore, interpretation of results from these methodologies are not restricted by assumptions of stock market efficiency.

Given the nature and structure of advantage and disadvantage inherent in the two research methodologies, it would seem that there is potential for each to support the other if used in combination. Such an approach also offers the opportunity for each methodology to be used

to open up and examine the results generated by the other. In addition, a large number of studies have confirmed the importance of accounting data to corporate management teams and to the stock market, (Whittington, 1979, 1988; Arnold and Moizer, 1984; Luckett, 1984; Kelly and Tippet, 1991; Brief and Lawson, 1991; Higson, 1991; Breton *et al.*, 1993), and a number of writers have pointed to advantages of using the two methodological approaches in the same study, and also the dearth of such studies, (Bradley, 1987; Higson, 1991). Therefore, both methodologies will be employed in the empirical research that follows.

Due to the presence of distortion and bias associated with methods of accounting for takeover transactions, no attempt will be made to compare pre-acquisition with post-acquisition outcomes. Therefore, the use of accounting data will be restricted to the discrimination methodology, whereby the financial characteristics will be used to test the relative pre-bid efficiency of acquired and acquiring firms. Fortunately, this methodological approach is well suited for tests of the management displacement hypothesis, which will be a major focus of the empirical research.

Details of the data sample, research designs employed and hypotheses tested will be described in detail at each stage of the empirical work, described in Chapters 4 through 7.

CHAPTER 4

The Shareholder Wealth Effects: 1980-90

1. INTRODUCTION

This chapter begins the empirical research which forms the substantive contribution of the thesis. Event study methodology is employed to examine and measure the impact of merger and acquisition activity on shareholder wealth. This is done for a sample of 559 pairs of matched acquirers and targets over the period 1980-90. The impact on wealth is calculated via two measures. The first is the average abnormal return cumulated over an event window, (CAARs), similar to that used in previous studies. The second measure has typically not been utilised in previous UK studies and consists of an estimate of the cash consequences for the shareholders of acquirers, targets, and for the aggregate for each pair of bidders and targets.

The purpose of the empirical work is to test two hypotheses that have featured prominently in both the empirical and policy literatures. First and foremost, the management displacement or disciplinary hypothesis of the market for corporate control. This hypothesis underpins the current UK public policy stance towards mergers, (DTI, 1988), and it is regarded as an accurate characterisation of recent merger activity, which has focussed on replacing inefficient management teams, rather than activity in earlier eras when '... the primary issue was the scale and scope of the activities of the firms concerned.' (Kay, 1988). The second hypothesis to be tested is the relatedness hypothesis. This, on the basis of modern portfolio theory, asserts that diversification in productive assets will not be valued by shareholders, implying that diversification is likely to be symptomatic of agency motives. However, evidence about the relatedness hypothesis is very mixed for the UK, (Limmack and McGregor, 1995), and so a re-examination of the issue is appropriate.

A particular feature of the empirical work presented here is the use of daily data, compared to monthly data, which has been employed in previous UK studies, (except Sudarsanam *et al.*, 1996). This is in contrast with work in the USA, where researchers have investigated shareholder wealth effects on the basis of daily data for some considerable time.

The empirical results show that targets make substantial gains. In contrast, the results for acquiring firms represent statistically significant wealth losses, at the time of bid announcement, over the interval from announcement to completion, and also post-outcome. Unlike most previous UK studies, the importance of the announcement to completion interval is emphasised. Overall, mergers and acquisitions increase total shareholder wealth, (excluding transaction costs), but the gains made by targets are at the expense of acquirers. Finally, there seems to be little difference between the results for related and unrelated acquirers.

The remainder of the chapter is organised as follows. The next section presents a brief review of the existing empirical evidence, together with an explanation of the theoretical framework that is employed. This is followed by a section on the data. The fourth section provides a detailed examination of the issues and problems involved with the event study technology. The fifth section presents the results for the test of the disciplinary hypothesis and the sixth section outlines the results for the relatedness hypothesis. The chapter ends with a summary and some concluding remarks.

2. DISCIPLINARY HYPOTHESIS: THEORY & EVIDENCE

2.1 The Theoretical Framework

The starting point of most M&A event studies is some version of the management displacement hypothesis (MDH). This posits that takeover bids represent the ultimate disciplinary mechanism over corporate management teams that fail to maximise shareholder wealth, (Manne, 1965; Fama, 1980). The market for corporate control is characterised as the site where rival management teams compete for control over corporate resources and assets, (Jensen, 1986). Displacement of an incumbent management team can occur because of inefficiency, (the inefficiency hypothesis), or because acquiring management teams simply possess globally

superior management skills, (differential efficiency hypothesis).

In either version, in order to wrest control from an incumbent management team, the acquirer will usually have to pay a premium over the existing market price of the target. Therefore, the announcement of a merger bid will be expected to result in positive abnormal returns for target shareholders. In the case of the bidding firms, a management team is expected to make a bid if, and only if, the acquisition or takeover represents (as a minimum) a zero net present value project. If this is indeed the case then the shareholders of the bidding firm should (as a minimum) not lose: that is, the bid will result in zero or positive abnormal returns for the shareholders of bidder firms. Thus either version of the MDH leads to an expectation that mergers and acquisitions will be value enhancing events, with a positive impact on the combined wealth of target and bidder shareholders. Furthermore, if the market for corporate control does indeed maintain a credible disciplinary role, the shareholders of successful bidders should not lose.

2.2 Empirical Evidence for the UK

As Limmack (1991) observes, the empirical results for the UK are inconsistent, which contrasts with the findings of US studies which are generally supportive of the disciplinary hypothesis. The event study technology was first applied to UK takeovers by Franks, Broyles and Hecht (1977). Using monthly data, with a sample of 74 M&As in the brewing and distilleries industry, over the period 1955-72, they found announcement gains to acquirers were sustained for a period up to 5 months after completion. This was followed by Barnes (1978) who found zero announcement period returns to bidders, in a sample of 39 industrial M&As, over the 1974-76 period. Using the same sample, but focusing on the post-completion period, Barnes (1984) found that acquirers made significant losses. Dodds and Quek (1985) suggest that the results from Barnes (1984) could be attributed to changes in test method. In their own sample of more than 70 industrial M&As, over the same 1974-76 period, Dodds and Quek found announcement period gains to bidders, that were sustained in the two year post-outcome period, but subsequently wiped out by post-completion losses from month +25 to month +60.

All these studies can be criticised for the small and, in the case of Franks, *et al.* (1977) industry specific, samples that were employed. In contrast, two studies by Firth (1979, 1980) employed

much larger samples over the period 1969-75, and for a sub-period 1972-74. Firth (1979) investigated a sample of 224 successful bids over the latter period and found no overall gain in shareholder wealth. Firth (1980), with a 1969-75 sample of over 400 firms, found that, on average, mergers were responsible for reducing shareholder value overall. While targets made substantial gains, these were more than offset by the losses made by acquirers in the post-completion period. Confirming mergers as potentially value-destroying events for successful bidders, Firth's sample showed that, on average, unsuccessful bidders subsequently outperformed the market for the 12 months following the bid failure. Parkinson and Dobbins (1993) confirm positive, though insignificant returns to unsuccessful bidders. The positive aspects of bid failure for unsuccessful bidders have also been reported in a qualitative study by Pickering (1983). In contrast, Holl *et al.* (1997) report significant losses to failed bidders.

In an attempt to resolve this inconsistent pattern of UK results, Franks and Harris (1989) examined a comprehensive sample of over 1,898 target firms and 1,058 bidders for the thirty years 1955-85. They presented a complex set of results which included attempts to uncover the impact that various bid characteristics have on shareholder wealth; for example, the form of payment, whether a bid is revised or contested, relative size of bidder and target, etc. Some of the results that they obtained were consistent with theoretical expectations, others were not. Nevertheless their conclusion about the fundamental disciplinary hypothesis is unequivocal when share-price responses are measured at bid announcement:

"... we find that mergers have, on average, been value-creating for shareholders as measured by equity market prices around the merger announcement. Shareholders of targets gain, and bidder shareholders gain or do not lose." Franks and Harris (1989: 247).

In contrast, when they examined abnormal performance post-completion, they found, using the market model benchmark¹, that

"... bidder postmerger performance is negative, cumulating to -13% by two years after the the merger. These losses are more than enough to offset the small positive wealth effects for bidders shown earlier [at announcement] Franks and Harris (1989: 244).

¹ . To be explained in section 4 below.

However, Franks and Harris point out that when alternative benchmarks are used, (the capital asset pricing model and the adjusted market model), the postmerger bidder performance is, on average, positive. This discrepancy in their results they attribute to the positive abnormal returns earned by bidders in the pre-bid period, which produces a downward bias in the postmerger bidder returns generated with the market model.

In a later study, Limmack (1991) also found a contradiction between the results obtained at announcement and those obtained postmerger, as well as inconsistencies in the results due to different benchmarks. However, his results lead him to conclude that

"... the gains made by target company shareholders are at the expense of shareholders of bidder companies." Limmack (1991: 251).

Limmack (1991) used a large sample of over 500 mergers for the period 1977-86, and whilst not as comprehensive a study as that of Franks and Harris (1989), it does serve as a substantial counter-weight to the evidence that they presented. Thus, despite recent attempts to '... resolve the conflicting evidence in the UK', (Franks and Harris, 1991: 225), there is still a lack of empirical regularity with respect to the shareholder wealth effects of UK merger activity.

3. SAMPLE DATA

An initial data sample was constructed from a number of sources. Kyriazis (1994) identified and kindly supplied a list of 614 bidders and their associated targets over the period 1963-85. In addition Salami (1995) also supplied a list of 619 bidder and targets (some were common to the list furnished by Kyriazis) for the period 1980-90. These data had been found by reference to *The Investors' Chronicle* and *Mergers and Acquisitions Monthly* and also from the data resources of other researchers, including Holl and Pickering (1988), Parkinson and Dobbins (1989), and Limmack (1990). In addition to the lists supplied by Kyriazis and Salami, 86 bidders and associated targets, from the 1980-90 period, were identified from various issues of *Mergers and Acquisitions Monthly* and the *Extel* database.

Salami (1995) also supplied data items about means of payment, directors' and institutional shareholdings, bidder toehold stakes, accounting policies, and bankruptcy measures.

Due to the requirement for three years of accounting data prior to bid announcement, all bids prior to 1980 were dropped from the sample. And because the present study focusses on the economic consequences of completed takeovers, all abandoned and successfully defended bids were also dropped,² as were bids involving firms in the financial and property sectors, due to the different accounting rules, policies and procedures applied to such firms. Accounting data items were collected from the *Datastream* database, including a variety of profitability ratios, asset utilisation ratios, and measures of cash flow, gearing, working capital, total equity and net assets employed. Data items were also collected for price-earnings ratios, market values, and dividends.

The requirement for daily share-price data for each firm, over a time interval stretching from 300 days prior to the initial bid announcement to 300 days after the bid announcement, accounted for a further loss from the sample. For those firms that remained in the sample, the contemporaneous *Financial Times All Share Index* data over the 601 days was collected to proxy the return on the market. The formal announcement date of each bid and the announcement date for the outcome of each bid (the unconditional date when the bidder announces control of enough target shares to guarantee control) were obtained from *The Financial Times* and *The Investors' Chronicle*.

The final sample consisted of 559 matched bidders and targets involved in bids made after 1 January 1980 and consummated prior to 31 December 1990.

Table 4.1 presents the sample by year of the bid announcement and by the characteristics of the bids in the sample. A bid is judged to be 'hostile' if the target management team recommends rejection in unequivocal terms and launches any form of defence strategy, otherwise the bid is classified as 'friendly'. A bid is classified as 'contested' if more than one bidder is involved, otherwise the bid is regarded as 'uncontested'. This classification of the data was based on reports in *Investors' Chronicle*, *Mergers and Acquisitions Monthly* and the *Extel* database. The

² Whilst the potential of such bids to act as a disciplinary threat is acknowledged, (see, for example, Bradley, Desai and Kim, 1983; Holl and Pickering, 1988), this issue is beyond the scope of the present study.

classification for the variable 'related' is obtained by comparing the main business activity of the successful bidder and the acquired firm, where firms' industry or sector designations are provided by *Datastream* classification level 4. The takeover is regarded as 'related' if bidder and target are both in the same *Datastream* category and 'unrelated' if not.

Table 4.1

Analysis of Data Sample by Year of Bid, Mood, Contested Status, and Business Match (degree of Relatedness).

	Bids	Hostile	Contested	Related
1980	11	3	2	2
1981	13	1	1	3
1982	10	2	0	2
1983	24	3	2	6
1984	43	9	4	19
1985	64	15	6	23
1986	98	16	10	33
1987	91	9	4	37
1988	72	7	5	30
1989	107	13	4	74
1990	26	7	3	6
Total	559	85	41	234

Table 4.2 provides summary measures of the financial characteristics of bidder and target subsamples. On average, bidders were some four times larger than the firms that they acquired. Against three measures of profitability, bidders in the sample were, on average, less profitable than targets. According to either version of the management displacement hypothesis this is, *prima facie*, counter-intuitive. Even when allowance is made for industry-specific effects, on average the targets have superior profit performance. The data also show that on average bidders are more highly geared and are marginally more liquid than targets.

Table 4.2

Average Values of Financial Characteristics of Bidders and Targets for 3 year Period prior to Bid Announcement

	Bidders	Targets
Return on Equity	16.10%	19.53%
Net Profit Margin	5.78%	6.53%
Operating Profit Margin	10.14%	11.69%
Gearing Ratio	0.527	0.429
Liquidity Ratio	1.419	1.404
Size (market value)	£571.909m	£139.165m

4. EVENT STUDY METHOD

4.1 Event Study Technology

Shareholder wealth effects were computed with standard event study technology, first developed by Fama *et al.* (1969). The economic content of information events (e.g. bid announcements) is measured by *abnormal share price returns*, (described in detail in Chapter 2, section 5.2):

$$(1) \quad AR_{i,t} = R_{i,t} - E[R_{i,t}]$$

where $AR_{i,t}$ is the abnormal share price return for the i th firm

$E[R_{i,t}]$ is the expected return estimated with an appropriate returns generating model

$R_{i,t}$ is the actual return of the i th firm.

4.2 Construction of Share Price Returns

In the present study logarithmic share-price returns were constructed as follows:

$$(2) \quad R_{i,t} = \ln \left[\frac{P_{i,t} + D_{i,t}}{P_{i,t-1}} \right]$$

where $R_{i,t}$ is the return to security i for day t ; $P_{i,t}$ is the price of security i at day t ; $P_{i,t-1}$ is the price at day $t-1$, adjusted for any capitalizations to make it comparable with $P_{i,t}$; and $D_{i,t}$ is the dividend paid on day t .

An alternative would have been to construct discrete returns, but as Strong (1992) points out,

there are both theoretical and practical reasons for preferring logarithmic returns. First, the logarithmic returns can be manipulated more conveniently, allowing daily returns to be simply added to form cumulated returns. Second, logarithmic returns are more likely to be normally distributed than discrete returns, thus making them more amenable to standard, parametric statistical testing, (see Fama, 1976 for US returns, and Theobald, 1980 for UK returns).

4.3 Choice of Measurement Interval for Returns

A number of measurement intervals for returns - monthly, weekly, and daily - have been employed in previous studies, (although the weekly measure has been used very infrequently). The choice of daily versus monthly returns data might not be trivial in the context of the event study method. First, monthly data present a number of statistical problems, usually summarised by Bradley and Jarrell (1988: 255) in the following way:

'The measurement of the economic effects of corporate events has long been an issue in financial economics. It is well known that market model parameter estimates based on monthly data are inefficient and nonstationary. Indeed, that is why the profession has moved toward using daily data. Parameter estimates are much more efficient using daily rather than monthly data.'

However, the use of daily data is also not without its problems. First, daily returns depart more from normality than do monthly returns, (Fama, 1976). More recently, Brown and Warner (1985) and Dyckman *et al.* (1984) confirm that, in their respective simulation samples, daily abnormal returns are not normally distributed. For example, in the latter study abnormal returns are leptokurtic with a negative median, with a χ^2 goodness of fit test confirming that the returns were not drawn from a normal distribution. According to Brown and Warner and Dyckman *et al.*, this result tends to increase the likelihood of Type 1 errors - that is finding abnormal performance where none exists. However, both pairs of researchers use simulations to show that this problem can be ameliorated considerably by increases in sample size, with convergence to normality for sample mean abnormal returns.³ With a sample in excess of 500 the present study should not suffer serious problems of leptokurtosis or skewedness, nor with problems of

³ Brown and Warner (1985) have a maximum portfolio (sample) size of 50; for Dyckman *et al.* (1984) the maximum was 100 securities.

statistical testing and inference. This assumption receives support from the conclusion drawn by Dyckman *et al.* (1984: 29), that '[T]he non-normality of individual-security daily-return residuals has little effect on the inferences drawn from the use of the *t*-test applied to portfolios.'

A second problem that is likely to be more severe with daily, as opposed to monthly data is the problem of thin trading, (Scholes and Williams, 1977). This issue will be examined separately and in more detail below.

The simulation studies of Brown and Warner (1985) and Dyckman *et al.* (1984) both demonstrate a preference for the use of daily data. Both show that under a variety of conditions standard parametric tests are well specified at the 5 per cent level with daily data. (Well specified here means that rejecting the null hypothesis of no abnormal performance does not occur more frequently than expected at a given level of significance.) These findings are also supported by the research of Jain (1986) who confirms that such tests are even well specified at more 'extreme levels of significance'.

Brown and Warner (1985) and Dyckman *et al.* (1984) also report that daily data allows for much more powerful tests of abnormal performance than tests based on monthly data. (Here power refers to rejection of the null when it is indeed false) Brown and Warner quantify this increase in power, reporting that, in the presence of an induced abnormal performance of 1 per cent, correct rejection of the null was 3 times higher with daily than with monthly data.

The simulation results (Brown and Warner, 1985; Dyckman *et al.*, 1984; Jain, 1986) are supported by the analytical work undertaken by Morse (1984). Morse undertakes an econometric analysis of the choice between monthly and daily data and how that choice might be affected by problems concerning the characteristics of the information event and the returns generating model that is employed. The problems associated with the information events he analysed were: (1) the existence of confounding information; (2) uncertainty over and variation in the magnitude of abnormal performance; (3) uncertainty over the timing of information release. He also analysed problems associated with the returns generating model, including: (1) errors in measurement; (2) structural changes in the model parameters; (3) model misspecification. Noting

the consistency of his analytic results with the simulation results of Brown and Warner and Dyckman *et al.*, Morse (1984: 606) summarises his econometric analysis in the following way:

'The results generally support the use of daily return data to estimate information effects, with the possible exception of cases in which there is uncertainty about the date of information release. Even with this uncertainty, however, daily returns may still be preferred to monthly returns in some situations.'

The need for accuracy in the identification of the announcement date has been noted already in Chapter 3, and it will be worthwhile reiterating Fama's clear and succinct statement of this requirement:

'The cleanest evidence ... from event studies, [comes] ... When an information event can be dated precisely and the event has a large effect on prices, the way one abstracts from expected returns is a second-order consideration. As a result, event studies can give a clear picture of the speed of adjustment of prices to information.' Fama (1991: 1607)

The simulations evidence demonstrate clearly that the longer the event window and the longer the measurement interval, the greater is the reduction in the power of the standard parametric tests used to identify abnormal performance. However, restricting the event window to just one day risks missing the information date entirely, thereby reducing the power to detect abnormal performance. A trade-off clearly exists, but it is not at all clear whether a one day test period or a longer event window is preferable.

Another issue that arises in respect of dating the information event has been identified by Strong (1992: fn 6):

'... in event studies of takeovers where, to capture the full share price effect of a takeover on either the bidder or target company, the TP [test period] should start at the date where the bid was first anticipated by the market. This suggests a further problem, which may particularly affect studies of events such as takeovers, of choosing the precise day that the bid was 'announced' to the market. If there is any difference across companies in the degree of anticipation or knowledge of the event by the market, then lining up companies' test period abnormal returns relative to the 'official' announcement date will inevitably weaken the power of any test to detect significant abnormal returns.'

This has been referred to as the problem of information 'leakage' and typically has been dealt with by simply extending the event window, (Franks and Harris, 1989; Limmack, 1991). This *problem and the issues associated with it* are analysed in more detail below.

Both the simulation and analytic evidence suggest clearly that a daily measurement interval is preferable and a daily measure has been chosen for the present study.⁴ This is consistent with the latest practice in the US, where virtually all event studies since the early 1980s have employed daily returns. In contrast, UK studies in the mergers field have, by and large, continued to use monthly returns, but this might have more to do with the ready availability of returns data than preference.⁵

4.4 Choice of Benchmark Model

A variety of returns-generating or benchmark models have been used in the event study literature. These include:

- (1) the ordinary least squares Market Model;
- (2) the Market-Adjusted Model;
- (3) the Mean-Adjusted Model;
- (4) the Capital Asset Pricing Model;
- (5) a Holding Period Model;⁶
- (6) an Industry index model.

Although a number of studies have used an industry index model, (for example, Langetieg, 1978), the simulation study by Thompson (1988) suggests that an industry index, whether used alone or in conjunction with a market index, has little impact on the results obtained. With respect to the holding period model, to date only Higson and Elliott (1998) appear to have utilised it and their results do not seem to be substantially different from other studies employing

⁴ However, as Strong (1992: 541) points out the simulation evidence is based on US data and so some care is required when extrapolating these results to the UK context.

⁵ In the UK the only returns database readily available to the academic researcher is the *London Share Price Data*, at the London Business School, which contains only monthly returns. In the US the *Centre for Research in Security Prices*, at the University of Chicago has provided daily data for NYSE-AMEX listed stocks since the early 1980s.

⁶ Higson and Elliott (1998) use the HPM approach to measure post-outcome returns to successful bidders in their sample. This suggests a trading strategy whereby an investor would choose and hold a bidder's stock over the full observation (event) period, as opposed to the other models which generally assume that the portfolio (of bidders) would be re-balanced over the event period.

more orthodox benchmarks.

The CAPM benchmark has been used in a number of UK studies, (for example, Franks and Harris, 1989; Limmack, 1991) but in no case does its use appear to have produced singularly different results, and they are often not reported.

Of the three remaining benchmarks, the simulation studies referred to above demonstrate the marginal superiority of the market model over the market-adjusted and mean-adjusted models, particularly in terms of their power to detect abnormal returns. Brown and Warner (1985) report that all three models are well specified, but that in terms of power both the market and market-adjusted models clearly outperform the mean-adjusted model.⁷ Dickman *et al.* (1984) find that the ability to detect abnormal performance is similar for all three models, but a statistically significant preference for the market model. Furthermore, Lahey and Conn (1990) report that market model and mean-adjusted returns are significantly and positively correlated, particularly over shorter event windows, (one year or less). Their study also shows that over longer windows the market model returns are smaller and thus represent a more 'conservative' measure of abnormal performance, which they cite as evidence for a more convincing and robust event study test. In his review Strong (1992) also favours the market model because of (i) its tendency to produce smaller abnormal returns variances than other benchmarks, giving it increased power to detect abnormal performance, and (ii) because it produces smaller cross-sectional correlations, which gives 'closer conformity to standard statistical tests'.

In the light of this evidence the market model is the preferred benchmark model for the present study. However, given the potential econometric problems associated with the estimation of the alpha and beta coefficients, (discussed in detail below), the market-adjusted model, which does not require the estimation of coefficients, is also employed to provide a check for the robustness of the market model results. The specification of both models is set out below.

The market model takes the form

⁷ They also find that their power is greater with daily than with monthly data.

$$(3) \quad E[R_{i,t}] = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} + \mu_{i,t}$$

and is the most heavily used returns generating model, having been utilised in almost all mergers and acquisitions event studies. The expected return, $E[R_{i,t}]$, is taken to be a linear function of the market index, $R_{m,t}$ on day t , and α and β are coefficients to be estimated prior to the event window, via ordinary least squares (OLS). The random error term, μ_{it} , has an expected mean of zero and conforms to the standard requirements of the OLS regression model.

The market-adjusted model takes the form

$$(4) \quad E[R_{i,t}] = R_{m,t} + \mu_{i,t}$$

With this model the expected return for the i th firm, $E[R_{i,t}]$, is taken to be the actual return on the market index, $R_{m,t}$. The abnormal return, u_{it} measures the abnormal return.

Following the literature, the present study cumulates abnormal returns over a number of event windows. The cumulation procedure allows for some uncertainty about the time that the market takes to adjust the share price in order to reflect fully the information released at bid announcement. It also allows for some uncertainty about the precise dating of information disclosure.

Abnormal returns are cumulated across N securities in the sample, for each event day, t , to produce the Average Abnormal Return, AAR_t

$$(5) \quad AAR_t = \sum_{i=1}^N AR_{i,t}$$

and then the average abnormal returns are then cumulated over the days in the event window, from $t=1$ to T ,

$$(6) \quad CAAR_T = \sum_{t=1}^T AAR_t$$

The $CAAR_T$ is then subjected to a t -test, against the null of zero abnormal returns.

4.5 Choice of Estimation Period for Market Model

There are two issues to be considered in respect of the choice of estimation period: first, its length and second, the potential for contamination from abnormal performance due to the anticipation of a bid in the pre-announcement period.

The length of estimation period adopted by event study researchers varies substantially. In the case of monthly data an implicit standard of 60 months seems to have emerged (for typical examples in the UK see Franks and Harris, 1989 and Limmack, 1991; for the US see Lambert and Larcker, 1985). In the case of daily data no such consensus is apparent. In the US, Dodd *et al.* (1984) used 600 days, Asquith (1983) used 480 days, and Scanlon, Trifts and Pettway (1989) used 240 days. In the only published UK study to use daily data, Sudarsanam, Holl and Salami (1996) employed an estimation period of 250 days. As Strong (1992:538) points out the choice of estimation period might not be trivial. With too long a period there is the potential for parameter shifts, but with too short a period there is the possibility that abnormal performance is built into the parameter estimation.

A number of researchers have examined the sensitivity of market model coefficients to the length of the estimation period, (Connell and Conn, 1993; Bradley and Jarrell, 1988; Maggenheim and Mueller, 1988). All demonstrated such sensitivity and, in the absence of an analytical procedure to ameliorate the potential problem, it remains an empirical question. Bearing in mind such concerns, the estimation period in the present study was subjected to a sensitivity analysis to ensure that reliable estimates of α and β were obtained. The end point of the estimation period was fixed at day -300 and the start point varied from day -1 to day -120 in steps of 10 days. These variations in the length of estimation period had little impact on the parameter estimates. It also suggested that abnormal performance in the pre-announcement period, due to anticipation of a bid, was not a particular problem in the present sample, although this issue is examined in more detail in section 5 below. This finding is contrary to some previous UK studies, albeit those

employing monthly data, (see Firth, 1979, 1980; Franks and Harris, 1988; Limmack, 1991)⁸, but it is consistent with the US study of Jain (1986), who employed daily data.

The present study follows the convention of allowing a gap between estimation and event windows, and the parameters of the market model benchmark are estimated over a period from day -300 to day -80 prior to the announcement date, (day 0).⁹ The mean values for the estimates of α and β are contained in Table 4.3 and are compared to the results from four recent studies where the values for these estimates have been provided. Strictly the results are not directly comparable with the first three because they employed monthly data. Nevertheless, the fact that the average alpha value is close to zero suggests that one of the potential sources of bias suffered in other studies (Limmack, 1991:242) might be less problematic in the current study. Similarly, the comparability of beta values suggests subsequent results are not likely to suffer unduly from bias in the risk measurement.

Table 4.3

Cross-Study Comparison of Alpha and Beta Estimates for UK Bidders

	Alpha	Beta
Present Study	0.000	0.951
Connell & Conn (1993)	0.003	1.061
Limmack (1991)	0.006	0.860
Franks & Harris (1989)	0.010	0.920
Jain (1986)	-0.000	1.015

⁸ In the only previously published UK study to use daily data, an event window day -40 to +day 40 is employed in order to capture any abnormal pre-bid performance, although the authors do not report any explicit test for this, Sudarsanam *et al.* (1996),

⁹ In their simulation studies Brown and Warner (1985), Dickman *et al.* (1984) and Jain (1986) used estimation periods of 239, 241 and 300 respectively. In their empirical study with daily UK data Sudarsanam *et al.* (1996) used 250 day estimation period and so the estimation period of 221 days (-300 to -80) is slightly shorter but within a similar range to these studies.

4.6 The Problem of Infrequent Trading

A potentially important concern when estimating market model coefficients is the phenomenon of 'thin trading', which is likely to be particularly problematic when daily data is used, (Scholes and Williams, 1977: 309). Thin trading can produce bias in estimation, such that the OLS estimates of alpha and beta for infrequently traded shares are asymptotically biased upward and downward respectively. In the case of frequently traded shares, the biases are reversed, (see Dimson, 1979 for UK data, and Scholes and Williams, 1977 for US data).

A number of procedures have been devised to deal with this problem, although the results from simulation studies cast doubt on whether these procedures, in practice, improve the detection of abnormal returns. Brown and Warner (1985) tested the thin trading adjustments suggested by Scholes and Williams (1977) and Dimson (1979). Their results show clearly that neither procedure improves on the standard OLS procedure in the detection of abnormal returns, regardless of the level of abnormal returns induced in their simulation. Even when they divide their sample by frequency of trading, (as proxied by exchange listing, NYSE vs AMEX), the thin trading adjustments offer no clear improvement in either the specification or power of the tests. As BW point out, even if bias in the estimated coefficients exists, the bias in beta is offset by a counter-bias in alpha and that '[that] by construction' OLS residuals for a security sum to zero in the estimation period', Brown and Warner (1985: 16). Thus bias due to thin trading does not necessarily imply misspecification in an OLS event study, particularly if the sample possesses a representative spread of trading activity and does not suffer from event date clustering: conditions which are broadly fulfilled for the present sample.

Dickman *et al.* (1984) tested the same thin trading adjustments in their simulation experiment and reached broadly the same conclusions as BW, both with respect to the specification and power of standard statistical tests. However, they did enter a caveat due to the likelihood of a bias towards larger (as hence more frequently traded) firms in their sample. Jain (1986) has also tested the effectiveness of the Scholes and Williams adjustment and confirmed the results obtained by BW and DPS.

In a more recent study, Cowan and Sergeant (1996) employed US data on trading volumes that

was not available in the earlier simulation experiments. They also confirm that the Scholes and Williams thin trading adjustment does not improve test performance, under conditions of no increase or increased variance between estimation and event periods.

The evidence from these simulation experiments seems to suggest fairly clearly that the standard adjustments for the thin trading problem offer little or no improvement over the standard OLS procedure. Nevertheless, because some securities in the current sample exhibited clear evidence of thin trading, the issue was examined in the context of the present study and the *Dimson Aggregate Coefficients* (DAC) procedure, (Dimson, 1979), with the adjustment suggested by Fowler and Rorke (1983) employed to test for its impact on the results. Consistent with the results of the simulation studies above, an initial exploration of the DAC procedure made little difference to the results obtained and so it has not been used in the present study.

An alternative to the Scholes and Williams and the DAC adjustments is the trade-to-trade (TT) estimation procedure advocated by Dimson and Marsh (1983). It has been shown that the TT method has a tendency to over-estimate beta slightly, but that it is efficient, (Dimson, 1977: 210). It has also been demonstrated with monthly data that with precise dating of an information event, it is more efficient than either of the two alternative approaches, (Dimson and Marsh, 1983: 757). In the light of this finding it was decided to use the simple TT thin trading adjustment in the estimation of market model parameters. All results were produced and reported on that basis.¹⁰

4.7 Variance Estimation

The efficiency of variance estimates for standard statistical testing is clearly important. Problems with variance estimates can arise in three ways. First, with non-synchronous trading, daily abnormal returns could include an element of serial dependence; second, the variance estimate might be biased by cross-sectional dependence in security returns; third, an information event might induce an increase in variance, (Brown and Warner, 1985:5). The BW simulations examined these issues and their results are reviewed briefly below.

¹⁰ Thanks are due to Professor Robin Limmack for this suggestion during a conversation at the ICAEW-ACCA-JBFA Capital Markets Conference 1996. In the event the TT adjustment, as with the DAC adjustment, did not make a substantial difference to the unadjusted OLS results.

In the BW simulations both the Scholes and Williams and the DAC adjustments failed to produce any clear differences in the specification or power of event study statistical tests. In addition, BW also show that both adjustments fail to purge autocorrelation from estimated abnormal returns. Although the reported autocorrelation magnitudes were small, they were statistically significant, from which BW concluded that, in the case of *cumulated* abnormal returns, the presence of autocorrelation could result in test misspecification. However, an autocorrelation adjustment performed by BW failed to make any substantial change when compared to the unadjusted OLS results. On that the basis of that result, no autocorrelation adjustment was made in the present study.¹¹

The early studies of cross-sectional dependence in abnormal returns, showed that when the variance is estimated from the time series of *mean* abnormal returns in the estimation period, cross-sectional dependence is incorporated, (Brown and Warner, 1980; Beaver, 1981; Collins and Dent,¹²1984). However, on the basis of their simulations BW report that in the absence of event date clustering, (a condition that is satisfied in the present study), ignoring low degrees of cross-sectional 'dependence induces little bias in variance estimates'. Furthermore, they argue that, paradoxically, adjusting for dependence might not be as efficient as assuming cross-sectional independence. Their simulations demonstrate the validity of this proposition, with enhanced power in statistical tests based on the independence assumption. This result has subsequently been confirmed in the study by Boehmer *et al.* (1991).

The final issue concerns an increase in variance induced by the information event to be investigated. As BW pointed out, estimating abnormal returns variance from estimation period returns will tend to result in test misspecification. By doubling the event variance in their simulation sample and using estimation period variance estimates, BW demonstrated that the magnitude of misspecification could be considerable. An alternative to this procedure would be to estimate the variance from the cross section of event period abnormal returns, under the

¹¹ In fact B&W do describe 2 cases where the adjustment produced 'small but notable improvement in test statistic specification', Brown and Warner (1985: 20), but neither applies in the present study.

¹² Brown and Warner actually refer to an earlier working paper version of the Collins and Dent paper.

assumption of independent and identically distributed abnormal returns. BW showed that this procedure improves the specification of tests in the presence of increased variance, but that this improvement is achieved at the cost of power loss if, in fact, no variance increase is present. Furthermore, the i.i.d. assumption requires that the variance increase has to be the same for all securities; an assumption that might not hold in a sample where a bid announcement will be regarded as 'good news' for some bidders and 'bad news' for others.

However, the simulation results from Boehmer *et al.* (1991) show clearly that this latter requirement does not cause serious problems for the cross-sectional event period variance estimator, even when there is no event period increase in variance. With event induced variance increase, the cross-sectional approach is shown to be superior in terms of both specification and power, particularly when combined with a sign test.¹³

In the light of the evidence from these simulation studies and due to the clear likelihood of an event-induced increase in variance, the variance of abnormal returns will be estimated cross-sectionally in event time, under the assumption of cross-sectional independence.

4.8 Use of Non-parametric Tests

The problem of the thin trading for parameter estimates and the related problem of variance estimation clearly have an important bearing on the specification and power of event study tests. So far these matters have been examined in the context of testing via parametric statistics. An alternative approach, which would avoid difficulties imposed by the requirement of normality, would be to use a non-parametric approach. An obvious drawback, however, is that the parametric approaches typically provide more powerful test procedures. Nevertheless, the non-parametric approach, and specifically the sign test, has found a place in the more recent literature, (for UK examples see, Franks and Harris, 1989; Limmack, 1991; Higson and Elliott, 1998).

In a recent simulation study, Cowan and Sergeant (1996) conducted a systematic comparison of the specification and power of two parametric testing procedures (Patell's standardized *t*-test and

¹³ Boehmer *et al.* (1991) advocate a standardized version of the cross-sectional variance, but as it appears to make no effective difference to the results reported below, it has not been utilised in the present study.

the standardized cross-sectional test of Boehmer *et al.*, 1991), *versus* two non-parametric tests, (the rank and the generalized sign tests). Making use of recently available trading volume data on the CRSP files, Cowan and Sergeant are able to explore the impact of thin trading in a direct and explicit fashion, whereas earlier studies, (for example, Brown and Warner, 1985; Dyckman *et al.*, 1984), relied on exchange listing as a proxy for thin trading. Their tests of specification and power are conducted for simulations both with and without variance increases in the event period.

The results from Cowans and Sergeant (1996) suggest that the sign test performs slightly better than a non-parametric rank test, and provides a useful cross-check on the results from parametric tests. With no increase in variance and with thin trading, the Patell standardized test is "poorly specified" and both non-parametric tests outperform the generalized cross-sectional test in thin trading samples, without sacrificing power in actively traded samples. In the case of increased variance in the event period, the problems for the Patell test is "severe", although all tests suffer in one way or another. However, the clear conclusion is that, in the presence of thin trading, '... the standardized cross-sectional statistic should be used for upper-tailed tests and the generalized sign statistic for lower-tailed tests', Cowans and Sergeant (1996: 1756). In the light of these results and following recent practice the sign test has been utilised in the present study.

The sign test compares the percentage of positive abnormal returns against a binomial distribution with an expected probability of 50 per cent: this is the procedure adopted by Franks and Harris (1989). An alternative would be to estimate the expected probability empirically; but this would only be appropriate if there were a good reason to think that it is likely to differ systematically from 50 per cent. Both Cowans and Sergeant (1996) and Higson and Elliott (1998) argue that there is a need to undertake this empirical estimation, because *share price returns* typically suffer positive skew, (Fama, 1976). This would mean that the expected proportion of positive returns is less 50 per cent. However, as Roll (1986) and Franks and Harris (1989) point out, in the context of the market for corporate control, at worst, it would seem reasonable to expect that any acquisition should have at least an equal chance of resulting in a positive *abnormal* return. Therefore the binomial test will be used with an expected value of 50 per cent.

4.9 Choice of Event Windows

In an information efficient market, new information is incorporated instantaneously, (Fama, 1991). Assuming an efficient market, and with precise dating of the information release the optimum event window should be drawn as narrowly as possible. However, if the market responds to new information with a lag, or if there is leakage of information prior to the published announcement, or, uncertainty about the announcement date, then a narrowly drawn event window might fail to capture the full price response to an information release. Therefore some care must be taken over the choice of event window(s), as the literature clearly demonstrates.

Using the same sample of monthly data, Maggenheim and Mueller (1988) and Bradley and Jarrell (1988) demonstrated clearly that variation in the length of the event window (as well as the length of the estimation period) can have an important impact on the results from a standard event study. A more focussed and systematic examination of the optimum length of event window and of event date uncertainty was conducted by Dyckman *et al.* (1984). Using simulation techniques and daily data they found, not surprisingly perhaps, that, *ceteris paribus*,¹⁴ the narrower the window and the less uncertainty over the event date, the greater the power of standard statistical tests.

In the case of the present study there can be reasonable confidence over the first date on which a bid announcement was published, (save for transcription errors). Given this confidence then a three day event window (day -1 to day +1) should be sufficient to ensure that the announcement event is captured. However, a number of studies have argued that locating the first date at which the market actually learned of the bid announcement is rather more problematic, (Franks and Harris, 1989). As outlined in section 4.5, the issue of abnormal performance due to bid anticipation cannot be ruled out. By the some token it is clearly not possible to date such anticipation. One way to deal with the problem would be to broaden the event window in the hope of capturing the effects of any information leakage prior to formal publication of a bid announcement, (see, for example, Franks and Harris, 1989; Sudarsanam *et al.*, 1996).

¹⁴ Holding portfolio size and the magnitude of abnormal returns constant.

A drawback with this approach is that the mode of the test is transformed to that of an *association study*, rather than an event study, and strictly only the latter is able to capture the economic content of *specific* information events, (see Strong, 1991: 539). An association test, with long windows suffers the potentially serious disadvantage of incorporating various confounding information events, or "event smearing", (Brown and Warner, 1980).

Another consideration concerns the nature of the phenomenon under examination. An event study is about modelling the market's reaction to new information, which means that a reaction will only occur to the extent that the market is 'surprised', or the event is unanticipated. If this were not the case then, in an efficient market, the information would already have been incorporated in the current share price. In the presence of anticipation, of course, an event study cannot be relied on to measure the wealth effects associated with any specific information event. If the market is able, on average, to anticipate a bid announcement correctly, formal announcement of a bid should not, on average, induce abnormal performance. However, many studies indicate that the market does indeed respond at announcement.

Limmack (1991) is clear that any abnormal performance for bidders in the pre-announcement period cannot be construed simply as due to bid anticipation alone. Even if confounding information events were not a problem, it still has to be explained why the market only responds partially to the anticipation of a bid, (partial, because of the subsequent price reaction at announcement). Of course, in anticipating a bid the market is making a probabilistic judgement about, *inter alia*, the likely success of the bid. It could, therefore, be considered rational for any anticipatory price reaction not to reflect in full the expected present value consequences of the anticipated acquisition. Dontoh *et al.* (1995), using a rational expectations framework, provide a model that could provide a theoretical explanation for lagged and partial responses to information events. In such a situation pre-announcement abnormal performance could be considered to incorporate a partial adjustment to an anticipated bid, and this might then justify extending the event window. However, two problems remain: first, the potential for confounding information to impact on a bidder's share price. Second, the problem of dating the point at which the market begins to anticipate a bid, particularly when there is no *a priori* reason to expect that there would be a specific point, common to all bidders, at which the market would begin to

anticipate a bid.

In the case of targets, Limmack (1991) argues that any pre-bid abnormal performance can be more readily construed as due to anticipation of a bid. Using return and volume metrics for Australian data, Aitken and Czernkowski (1992) investigate pre-announcement abnormal performance of 66 targets. Although the pre-bid abnormal returns to targets were small and largely insignificant, Aitken and Czernkowski did demonstrate that abnormal performance could be linked to media reports. However, the empirical evidence on predicting targets from the population of firms as a trading strategy is not wholly convincing, (see Levine and Aaronovitch, 1981; Barnes, 1990; Powell and Thomas, 1994; and Palepu, 1986), and, even for targets, the question of abnormal returns in the pre-bid period seems to be an empirical question.

In view of these arguments and the evidence referred to above, a clear preference exists for a narrow event window (-1 to +1) to be drawn around the identified announcement date. However, this preference is tempered by a pragmatism which suggests that wider event windows should also be examined and so a variety of windows up to day +20 are also tested. In addition an explicit examination of the pre-announcement period is also undertaken for bidders and targets. The longer test periods will also facilitate the comparison with earlier UK studies that for the most part have been conducted with monthly data.

The second test period is from day -1 (day 0 is the date of announcement) to the declaration of the outcome. In the present study this is defined as the date when a bidder announces receipt of sufficient unconditional acceptances from target shareholders to achieve overall control. This period will be different for each bid and so the length of the event window, will be different in each case. Following Asquith (1983) in the US and Limmack (1991) in the UK, this period between bid announcement and completion, (A-C interval), is regarded as important for the full measurement of share-price responses to M&A bids.

It is clear that announcement CAARs alone might not reflect the full economic consequences of a takeover bid and *subsequent acquisition*. Following announcement, but prior to bid outcome, there is likely to be a stream of price sensitive new information events related to the bid. At

announcement the information available has two facets: first, information that bears on the likely success of a proposed acquisition, such as strategic fit, etc; second, information that bears on the likelihood of the success (failure) of the bid. However, the information release at announcement is unlikely to be the end of the story. Over the A-C interval explicit and tacit information disclosures are likely to be forthcoming from the management teams, shareholders, and also from third parties, such as rival firms, the Director General of Fair Trading, and others. Clearly any new information, such as price revisions, target management resistance, and so on, would have a bearing on the likelihood of a bid's success, and also on the economic prospects for any subsequent acquisition. The price responses to this additional information could only be captured by employing the A-C event window. Even so, an obvious drawback concerns the lack of precision in the identification of *specific* information events. As discussed above, strictly, this is a necessary requirement of the event study technique. However, this problem is addressed to some extent by measuring abnormal returns over the A-C interval *specific* to each case. This is in contrast to most other UK studies, (for example, Franks and Harris, 1989), which have employed a common event window for all firms, and thereby assumed, at least implicitly, that the A-C interval is the same for all firms.

The third event window covers the post-outcome period, following consummation of the merger or acquisition. The choice of +200 days for the post-outcome event window is not entirely consistent with previous studies, (for example, using monthly data, Franks and Harris, 1989 and Limmack, 1991 both adopt 24 months). But it is argued below that +200 days should be adequate to examine the market's response to the post-acquisition efforts of acquiring management teams to achieve a profitable acquisition.¹⁵

Despite the doubt expressed in the literature about the value of the post-outcome event window, (Jensen and Ruback, 1983: 20), negative post-merger drift of acquirers' abnormal returns has been a consistent feature of most studies. However, it has to be acknowledged that a number of statistical problems have been put forward as an explanation for the negative results. For

¹⁵ For example, in their survey of acquiring management teams, Coopers & Lybrand (1993) find that 73 per cent of finance directors consider that speedy implementation of post-acquisition plans is a vital ingredient of acquisition success.

example, Jensen and Ruback (1983) point to the problems of measurement error and sample selection bias. While Bernard and Thomas (1989) suggest that the negative drift can be explained by a change in risk adjustment consequent on consummation of the merger or acquisition, although this is explicitly rejected by Agrawal *et al.* (1992) following their exhaustive US study.

A similar problem to that encountered with the A-C interval, concerns the lack of precision in the identification of specific, merger-related information events in the post-merger window, together with the allied issue of setting an appropriate window length. In the case of the A-C interval it seems reasonable to assume that uncertainty over the bid outcome means that information released would be bid-related. Would the same assumption be reasonable in the case of the post-outcome period? In other words can post-outcome abnormal returns be assumed to be related to the (successful) acquisition?

In the immediate post-outcome period successful bidders are unlikely to generate abnormal returns. The market will have discounted the information received over the period from announcement to outcome and in doing so arrived at a judgement about the cash flow implications of a successful acquisition. Although that judgement cannot be resolved until the success or failure of the bid has been announced, agents in the market will have had the opportunity to arrive at a considered view about how they would respond to the news of success or failure. Therefore, on the day that the fate of the bid is known it might be expected that the market response to the news would be rapid and not subject to much revision. If that is so, then in the immediate post-outcome period, in the absence of new information, on average, zero abnormal returns might be expected.

But this situation, i.e. a lack of news relevant to the acquisition, is not likely to last for very long. On making the original bid announcement, the directors of a bidding firm would have presented the market with information about the rationale and justification for their bid. This information would also contain, either an explicit or implicit plan of action designed to make the acquisition achieve improved economic performance. Following the success of a bid, the market would then expect to see some timely manifestation of plan implementation, particularly as the difficulties of post-completion integration are well documented, (for example, Cartwright and Cooper, 1992;

Slatter, 1984; Wright, 1992; Platt, 1992; Balloun and Gridley, 1990). Thus abnormal performance recorded for a period after bid outcome could justifiably be interpreted as the market responding to new, acquisition-related information. This could include both action and inaction in respect of the benchmark plans made public by the bidder management team.

For example, the realisation of economies of scale might require plant and/or office closures and redundancies and the market would be expecting announcements of this sort of action. For a variety of reasons the acquiring management team might prefer to delay implementation of such action, or shrink from the scale of restructuring necessary. A lack of positive information about the implementation of pre-acquisition plans, or the failure to announce timely post-acquisition restructuring could well lead to a negative response from the market. Similarly, the loss of key staff from the acquired firm, or the opposite, a failure to remove the incumbent management team, might also attract a negative response from the market. The circumstances surrounding each acquisition are likely to be different, but each represents a large scale investment, the implementation of which the market is likely to follow closely. The point to be made here is that it seems reasonable to suggest, and *could be* fully consistent with an information-efficient market, that the abnormal returns recorded after an acquisition are likely to be related to that acquisition. In other words, it is reasonable to expect that the total market response to a takeover bid might well extend over a longer time interval than the immediate bid announcement period. Indeed, to expect the market to capture the full net present value consequences of any potential takeover at announcement, is to require an unreasonable degree of 'clairvoyance' on the part of the market. In large scale empirical research appeal is made to the Central Limit Theorem, but in practice it seems reasonable to presume that investors are attempting definitive judgements in each specific case.

There is a possible objection to this line of reasoning, (see Jensen and Ruback 1983: 20), which holds that, *ceteris paribus*, post-outcome abnormal returns are inconsistent with an information-efficient market, and, in effect, should not be relied on. However, it seems improbable to argue against the proposition that the market will monitor the implementation of an acquisition and respond to *new* information gleaned about the successes or otherwise of the acquiring management team. This line of reasoning also receives support from a recent theoretical

contribution which suggests that although delayed price responses to incremental information might not be considered consistent with the conventional view of an efficient markets framework, they could be fully consistent with a market exhibiting rational expectations, Donto *et al.* (1995).

Capturing its intended target is only part of the task faced by the successful bidder. How the acquiring team copes with the (perhaps more difficult) task of integrating the assets of the acquired business is likely to be of considerable interest to the market for a considerable period. Of course, for the purposes of an event study, (strictly an association study, with long event windows), how long is a 'considerable period' is open to question. An obvious answer is - for as long as *new* information is available about the acquisition. To be in a position to know this would require constant monitoring of the financial press for an extended period of time. In the context of a large sample study such a monitoring exercise is not feasible and so a judgement has to be made as to an appropriate cut-off point. In this case the cut-off point has been assigned at +200 days post-outcome. This amounts to approximately 9 months in calendar time and appears to be a more conservative estimate about the period over which it is reasonable to assume that price revisions relate to an acquisition and are not too contaminated with more general information about acquiring firms. Ultimately, of course, the length of the post-outcome event window is arbitrary. While it has been demonstrated that the longer the post-outcome event window is drawn, the greater the losses to acquiring firms, (Maggenheim and Mueller, 1988), a narrower window is preferred here to avoid any undue bias from contamination.

5 EMPIRICAL RESULTS - 1980-90

While positive and substantial returns to target firms has been a consistent feature of the empirical literature, the set of UK results for bidding firms has been notable only for the lack of consistency. Some studies have shown gains and some losses; for some studies the results have been statistically significant, and in others not. As far as possible the results reported here will be compared throughout with previous UK studies, even though all but one have used monthly data.

The results for the various event windows are set out and discussed sequentially, beginning with the pre-announcement period, and followed by the announcement period, and then the A-C interval, finishing with the post-outcome window. Results are presented for both equally-weighted and value-weighted abnormal returns, using the market model as the benchmark. Although the market-adjusted model was also applied, the results that it generated were not very different in terms of either magnitude or statistical significance and so they are not reported. The results of the net cash returns to pairs of bidders and targets are presented next, and finally the results connected with the relatedness hypothesis .

5.1 Abnormal Returns to Bidders and Targets in the Pre-bid Period

The empirical investigation begins with a test for abnormal performance in the pre-bid period. This is carried out for both bidders and targets for up to 80 days prior to bid announcement (Tables 4.4 and 4.5). On an equally-weighted basis, the abnormal returns to bidders over the pre-bid period are approximately one per cent and positive, but they are not statistically significant. On a value-weighted basis the returns are positive but lower and still insignificant. Although the parametric tests are insignificant, the non-parametric binomial test for the percentage of positive returns is significant with over fifty per cent of bidders showing positive returns. The parametric results are in contrast with the recent UK findings of Franks and Harris (1989) and Limmack (1991), but consistent with the earlier findings from Firth (1979, 1980), and with some similarities to the results reported by Sudarsanam *et al.* (1996).

On an equally-weighted basis targets made positive and statistically significant gains, whilst on a value-weighted basis they made very small and insignificant losses. The latter result suggests that the market might find it easier to identify smaller rather than larger targets; or, alternatively, that smaller firms which were performing well were as likely to be targets as larger, poorly performing firms. The latter interpretation would clearly be incompatible with the orthodoxy in relation to the discipline that the takeover market is meant to impose over the management teams of poorly performing firms. However, any interpretation of the results for targets must be treated with some caution, because positive returns to smaller targets could be symptomatic of either good management performance, or bid anticipation.

Table 4.4

Bidders' Equally-Weighted and Valued-Weighted Market Model Cumulative Average Abnormal Returns for Pre-bid period Prior to Announcement Date, for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-20,0)	0.006	56 ^a	1.50	0.000	56 ^a	0.51
CAAR(-30,0)	0.009	56 ^a	1.51	0.001	56 ^a	1.03
CAAR(-40,0)	0.011	55 ^b	1.56	0.001	55 ^b	1.11
CAAR(-50,0)	0.010	56 ^a	1.12	0.000	56 ^a	0.56
CAAR(-60,0)	0.004	55 ^b	0.48	-0.001	55 ^b	0.58
CAAR(-70,0)	0.011	56 ^a	1.00	-0.001	56 ^a	0.56
CAAR(-80,0)	0.013	56 ^a	1.08	-0.001	56 ^a	0.34

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

Table 4.5

Targets' Equally-Weighted and Value-Weighted Market Model Cumulative Average Abnormal Returns for Pre-bid period Prior to Announcement Date, for Sample Period 1980-90

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-20,0)	0.009 ^b	56 ^a	2.25	-0.001	56 ^a	0.36
CAAR(-30,0)	0.006	50	1.20	-0.005	50	1.22
CAAR(-40,0)	0.012 ^b	54 ^b	2.40	-0.003	54 ^b	0.98
CAAR(-50,0)	0.017 ^b	56 ^a	2.83	-0.004	56 ^a	1.04
CAAR(-60,0)	0.015 ^b	57 ^a	2.14	-0.004	57 ^a	1.00
CAAR(-70,0)	0.013 ^b	52	1.86	-0.006	52	1.20
CAAR(-80,0)	0.015 ^b	54 ^b	1.88	-0.008	54 ^b	1.14

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

These results, for the bidder and target samples, suggest that the subsequent announcement period outcomes, discussed below, are not likely to be unduly affected by performance in the pre-

Bid period.

5.2 Target Returns around Announcement

The announcement period equally- and value-weighted returns to targets are set out in Table 4.6. Panel A presents CAARs for a succession of event windows up to 21 days from the first announcement of the takeover bid, (the announcement date is set as day 0), and Panel B contains the CAAR for the announcement to completion interval.

As mentioned above, the literature suggests that results of event studies are more reliable when the event window is narrowly drawn, (Dyckman *et al.*, 1984; Bradley and Jarrell, 1988; Fama, 1991). But to allow comparison with earlier UK studies returns up to CAAR (0,20) have been included. Even so, a feature of the target results is that they appear to be robust and stable, even when the window is drawn more widely than might be considered desirable using daily data.

The results are unexceptional; targets make substantial and statistically significant gains, whether measured on a value- or equally weighted basis. They are consistent with, but somewhat lower than earlier UK studies, (Franks and Harris, 1989; Limmack, 1991; Sudarsanam *et al.*, 1996). There is considerable variation within the sample, with a first quartile figure of only 2 per cent, but a third quartile of over 30 per cent. Furthermore, as the differences between the equally- and value-weighted measures show, smaller firms seemed to have gained more than larger targets, a result consistent with Franks and Harris (1989).

To complete the picture and to allow comparison with earlier studies, Table 4.7 presents the wealth gains for targets over the period from day -60 to day +20. Using monthly data Franks and Harris (1989) use an event window (-4,+1) and Limmack (1991) uses (-3,+1). The results for the extended event windows are consistent with these two studies, although extending the window does not appear to have had a substantial impact.

Table 4.4

Bidders' Equally-Weighted and Valued-Weighted Market Model Cumulative Average Abnormal Returns for Pre-bid period Prior to Announcement Date, for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-20,0)	0.006	56 ^a	1.50	0.000	56 ^a	0.51
CAAR(-30,0)	0.009	56 ^a	1.51	0.001	56 ^a	1.03
CAAR(-40,0)	0.011	55 ^b	1.56	0.001	55 ^b	1.11
CAAR(-50,0)	0.010	56 ^a	1.12	0.000	56 ^a	0.56
CAAR(-60,0)	0.004	55 ^b	0.48	-0.001	55 ^b	0.58
CAAR(-70,0)	0.011	56 ^a	1.00	-0.001	56 ^a	0.56
CAAR(-80,0)	0.013	56 ^a	1.08	-0.001	56 ^a	0.34

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

Table 4.5

Targets' Equally-Weighted and Value-Weighted Market Model Cumulative Average Abnormal Returns for Pre-bid period Prior to Announcement Date, for Sample Period 1980-90

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-20,0)	0.009 ^b	56 ^a	2.25	-0.001	56 ^a	0.36
CAAR(-30,0)	0.006	50	1.20	-0.005	50	1.22
CAAR(-40,0)	0.012 ^b	54 ^b	2.40	-0.003	54 ^b	0.98
CAAR(-50,0)	0.017 ^b	56 ^a	2.83	-0.004	56 ^a	1.04
CAAR(-60,0)	0.015 ^b	57 ^a	2.14	-0.004	57 ^a	1.00
CAAR(-70,0)	0.013 ^b	52	1.86	-0.006	52	1.20
CAAR(-80,0)	0.015 ^b	54 ^b	1.88	-0.008	54 ^b	1.14

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

These results, for the bidder and target samples, suggest that the subsequent announcement period outcomes, discussed below, are not likely to be unduly affected by performance in the pre-

bid period.

5.2 Target Returns around Announcement

The announcement period equally- and value-weighted returns to targets are set out in Table 4.6. Panel A presents CAARs for a succession of event windows up to 21 days from the first announcement of the takeover bid, (the announcement date is set as day 0), and Panel B contains the CAAR for the announcement to completion interval.

As mentioned above, the literature suggests that results of event studies are more reliable when the event window is narrowly drawn, (Dyckman *et al.*, 1984; Bradley and Jarrell, 1988; Fama, 1991). But to allow comparison with earlier UK studies returns up to CAAR (0,20) have been included. Even so, a feature of the target results is that they appear to be robust and stable, even when the window is drawn more widely than might be considered desirable using daily data.

The results are unexceptional; targets make substantial and statistically significant gains, whether measured on a value- or equally weighted basis. They are consistent with, but somewhat lower than earlier UK studies, (Franks and Harris, 1989; Limmack, 1991; Sudarsanam *et al.*, 1996). There is considerable variation within the sample, with a first quartile figure of only 2 per cent, but a third quartile of over 30 per cent. Furthermore, as the differences between the equally- and value-weighted measures show, smaller firms seemed to have gained more than larger targets, a result consistent with Franks and Harris (1989).

To complete the picture and to allow comparison with earlier studies, Table 4.7 presents the wealth gains for targets over the period from day -60 to day +20. Using monthly data Franks and Harris (1989) use an event window (-4,+1) and Limmack (1991) uses (-3,+1). The results for the extended event windows are consistent with these two studies, although extending the window does not appear to have had a substantial impact.

Table 4.6

Targets' Equally-Weighted & Value-Weighted Market Model Cumulative Average Abnormal Returns Relative to Announcement Date and over the Announcement to Completion Interval for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
<i>Panel A: Target Abnormal Returns relative to Announcement Date</i>						
CAAR(-1,1)	0.179 ^a	96 ^a	4.75	0.135 ^a	96 ^a	6.91
CAAR(-1,2)	0.181 ^a	96 ^a	5.25	0.136 ^a	96 ^a	6.00
CAAR(-1,3)	0.182 ^a	96 ^a	5.50	0.137 ^a	96 ^a	6.16
CAAR(-1,4)	0.182 ^a	96 ^a	6.40	0.137 ^a	96 ^a	5.29
CAAR(-1,5)	0.183 ^a	96 ^a	6.61	0.138 ^a	96 ^a	5.29
CAAR(-1,6)	0.183 ^a	96 ^a	6.71	0.138 ^a	96 ^a	5.32
CAAR(-1,7)	0.181 ^a	97 ^a	6.20	0.138 ^a	97 ^a	5.36
CAAR(-1,8)	0.182 ^a	96 ^a	6.40	0.138 ^a	96 ^a	5.42
CAAR(-1,9)	0.183 ^a	96 ^a	6.60	0.137 ^a	96 ^a	5.28
CAAR(-1,10)	0.185 ^a	96 ^a	7.00	0.137 ^a	96 ^a	5.62
CAAR(-1,15)	0.187 ^a	95 ^a	7.40	0.138 ^a	95 ^a	5.54
CAAR(-1,20)	0.188 ^a	95 ^a	7.60	0.137 ^a	95 ^a	5.29
<i>Panel B: Target Abnormal Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	0.215 ^a	95 ^a	9.36	0.147 ^a	95 ^a	5.78

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

5.3 Bidder Returns around Announcement

The returns to bidders for the announcement period and the announcement to completion interval are set out in Tables 4.8 and 4.9. Although the preferred event window is one that is narrowly drawn, some of the previous UK studies have shown that bidders achieve positive abnormal returns in the pre-bid period, (for example, Franks and Harris, 1989). To capture this effect and for comparative purposes the first set of event windows for the announcement period were extended to include abnormal returns cumulated from day -60.

Table 4.7

Targets' Equally-Weighted & Value-Weighted Market Model Cumulative Average Abnormal Returns from day -60 Pre-bid to Post-Announcement Period 1980-90

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-60,1)	0.191 ^a	93 ^a	7.28	0.132 ^a	93 ^a	8.00
CAAR(-60,2)	0.193 ^a	94 ^a	7.57	0.133 ^a	94 ^a	8.25
CAAR(-60,3)	0.194 ^a	93 ^a	7.53	0.134 ^a	93 ^a	6.80
CAAR(-60,4)	0.194 ^a	93 ^a	7.71	0.134 ^a	93 ^a	5.67
CAAR(-60,5)	0.195 ^a	94 ^a	7.86	0.135 ^a	94 ^a	5.22
CAAR(-60,6)	0.194 ^a	93 ^a	7.86	0.135 ^a	93 ^a	5.00
CAAR(-60,7)	0.193 ^a	93 ^a	7.57	0.135 ^a	93 ^a	5.83
CAAR(-60,8)	0.194 ^a	93 ^a	7.71	0.135 ^a	93 ^a	5.83
CAAR(-60,9)	0.195 ^a	93 ^a	7.86	0.134 ^a	93 ^a	5.51
CAAR(-60,10)	0.197 ^a	93 ^a	8.14	0.134 ^a	93 ^a	5.67
CAAR(-60,15)	0.199 ^a	93 ^a	8.43	0.135 ^a	93 ^a	5.83
CAAR(-60,20)	0.200 ^a	93 ^a	8.57	0.135 ^a	93 ^a	5.83

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

Despite the positive (but statistically insignificant) returns to bidders in the pre-bid period, (Table 4.4), bidders suffer small losses for the various event windows from day -60 to one month after bid announcement. The value-weighted losses are a little larger, suggesting that larger firms do less well, but all results are statistically insignificant, except for the value-weighted (-60,+20) window which is significant at the 10 per cent level. The non-parametric binomial test for the percentage of positive returns shows that 55 per cent of bidders have negative returns, significant at the 5 per cent level.

The results for event windows more narrowly focussed around bid announcement are set out in Table 4.9. The results in Panel A are the CAARs for a succession of event windows from day -1 to day +20, with Panel B providing the results over the announcement to completion interval.

Table 4.8

Bidders' Equally-Weighted & Value-Weighted Market Model Cumulative Average Abnormal Returns from day -60 Pre-bid to Post-Announcement Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(-60,1)	-0.001	45 ^b	0.52	-0.007	45 ^b	0.88
CAAR(-60,2)	-0.001	45 ^b	0.53	-0.009	45 ^b	1.12
CAAR(-60,3)	-0.001	45 ^b	0.50	-0.009	45 ^b	1.13
CAAR(-60,4)	-0.002	45 ^b	1.03	-0.009	45 ^b	1.13
CAAR(-60,5)	-0.002	44 ^b	1.07	-0.011	44 ^b	1.36
CAAR(-60,6)	-0.002	45 ^b	0.99	-0.010	45 ^b	1.25
CAAR(-60,7)	-0.002	45 ^b	0.97	-0.009	45 ^b	1.12
CAAR(-60,8)	-0.002	45 ^b	1.06	-0.009	45 ^b	1.11
CAAR(-60,9)	-0.002	45 ^b	1.01	-0.009	45 ^b	1.13
CAAR(-60,10)	-0.001	45 ^b	0.53	-0.008	45 ^b	0.86
CAAR(-60,15)	-0.002	45 ^b	1.03	-0.013	45 ^b	1.44
CAAR(-60,20)	-0.003	45 ^b	1.51	-0.015 ^c	45 ^b	1.65

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

The wealth effects for bidders are negative and statistically significant at the one per cent level for one month from announcement - i.e. from the three day event window (-1,1) to the twenty-one day window (-1,20). The results are fairly stable as the event window is drawn wider, although there is a small downward drift. The shareholders of bidding firms suffer negative abnormal returns of approximately two per cent on an equally-weighted basis, and as much as three and a half per cent with value-weighted returns. The latter suggest that larger bidders do not perform as well as smaller bidders, and that is consistent with at least one aspect of the findings of Franks and Harris (1989), even though overall the bidders in their sample made gains rather than losses.

The substantial and significant losses to bidders in the announcement period are consistent with Firth (1980) and Sudarsanam *et al.* (1996), but contradict the significant gains reported by Franks *et al.* (1977), Dodds and Quek (1985), Franks and Harris (1989), and the approximately zero

abnormal returns reported by Barnes (1978), Firth (1979), and Limmack (1991).

Table 4.9

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns
(i) Relative to Announcement Date, (ii) over Announcement to Completion Interval,
for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
<i>Panel A: Bidder Abnormal Returns relative to Announcement Date</i>						
CAAR(-1,1)	-0.018 ^a	35 ^a	6.03	-0.026 ^a	35 ^a	8.67
CAAR(-1,2)	-0.020 ^a	34 ^a	6.64	-0.028 ^a	34 ^a	9.33
CAAR(-1,3)	-0.020 ^a	35 ^a	6.68	-0.028 ^a	35 ^a	9.38
CAAR(-1,4)	-0.021 ^a	32 ^a	7.02	-0.029 ^a	32 ^a	9.67
CAAR(-1,5)	-0.022 ^a	31 ^a	7.09	-0.030 ^a	31 ^a	10.00
CAAR(-1,6)	-0.021 ^a	31 ^a	7.05	-0.030 ^a	31 ^a	10.00
CAAR(-1,7)	-0.021 ^a	31 ^a	7.01	-0.029 ^a	31 ^a	9.67
CAAR(-1,8)	-0.022 ^a	33 ^a	7.11	-0.029 ^a	33 ^a	9.67
CAAR(-1,9)	-0.020 ^a	34 ^a	6.81	-0.028 ^a	34 ^a	7.02
CAAR(-1,10)	-0.019 ^a	35 ^a	4.93	-0.027 ^a	35 ^a	6.75
CAAR(-1,15)	-0.024 ^a	34 ^a	6.03	-0.032 ^a	34 ^a	8.04
CAAR(-1,20)	-0.027 ^a	34 ^a	5.41	-0.035 ^a	34 ^a	7.00
<i>Panel B: Bidder Abnormal Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.030 ^a	45 ^a	5.02	-0.039 ^a	45 ^a	6.86

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

On the basis of the announcement results reported here, it would appear that at bid announcement the market for corporate control views acquisitions as, on average, negative NPV projects. For the longer event windows incorporating the pre-bid period losses are considerably smaller and are not significant. Even so, the non-parametric test shows that bidders suffered negative returns in well over half of the cases. Furthermore, the insignificant parametric results for the longer windows still leave open the question of the clear negative response at bid announcement.

If account is taken of the full announcement to completion interval, then on an equally-weighted basis average bidder losses increase to a statistically significant 3 per cent. An examination of

the distribution of returns shows that losses at the first quartile increase to almost 10 per cent, whereas at the third quartile bidders make gains of 4 per cent. Well over half of bidding firms make losses, significant at the one per cent level in the binomial test. On a value-weighted basis, losses reach almost four cent, again suggesting that larger firms suffer greater losses over the A-C interval.

In the only other UK study to examine the A-C interval specifically, (Limmack, 1991), equally-weighted returns to bidders in completed acquisitions are also negative, but not statistically different from zero. With value-weighted returns, however, Limmack finds statistically significant losses of two and a half per cent, with 54 per cent of bidders recording losses.

In the case of the bidding firms, the issues that the market is grappling with over the A-C interval are likely to be much more complex than for targets, and so this period is of considerable interest. The matters of, *inter alia*, the likelihood of bid success, the elicitation of rival bids, target management resistance, and the upward revision of the bid terms are all important considerations. But in addition, and perhaps most important, the market will also be attempting to assess the ability of the bidding management team to make a success of the acquisition should the bid succeed. This could be particularly difficult because it involves assessment of factors not necessarily under the control of the bidding firm, such as external conditions in the product market, the reactions of rival firms, and the like. Given this added complexity, it seems reasonable to suggest that there might be large A-C period revisions in the share prices of bidders. This line of reasoning receives support from the results of Tables 4.10 and 4.11.

First, in Table 4.10 the differences between bidder CAARs at announcement and those for the A-C interval were tested and found to be statistically significant at the 5 per cent level. This could be interpreted as evidence for market responses to price sensitive information, such as the likelihood of bid success and the cash flows consequences of acquisition.

Table 4.10

T-tests for Equality of Bidders' CAARs at Announcement and over A-C Interval

	CAAR(t,T)	CAAR ^{a-c}	Difference	t-value
CAAR(-1,1)	-0.018	-0.030	0.012 ^a	2.69
CAAR(-1,2)	-0.020	-0.030	0.010 ^a	3.23
CAAR(-1,3)	-0.020	-0.030	0.010 ^a	3.31
CAAR(-1,4)	-0.021	-0.030	0.009 ^a	2.96
CAAR(-1,5)	-0.022	-0.030	0.008 ^a	2.90
CAAR(-1,6)	-0.021	-0.030	0.009 ^a	2.96
CAAR(-1,7)	-0.021	-0.030	0.009 ^a	2.91
CAAR(-1,8)	-0.022	-0.030	0.008 ^a	1.94
CAAR(-1,9)	-0.020	-0.030	0.010 ^a	2.84
CAAR(-1,10)	-0.019	-0.030	0.011 ^a	2.72

N=559 ^a 5 per cent significance level using a paired sample test

Given that at announcement the market judges that in excess of 50 per cent of bids are likely to have a negative wealth effects for bidders, is that initial judgement, on average, confirmed at the time that the bid outcome is known? In an attempt to address this question the sign of CAARs for individual bidders at announcement and over the full A-C interval were compared. The results are displayed in Table 4.11.

Table 4.11

Comparison of the sign of Bidders' CARs at Announcement and over A-C Interval

	- / -	- / +	+ / -	+ / +
CAAR(-1,1)	202	159	104	94
CAAR(-1,5)	219	168	87	85
CAAR(-1,10)	208	156	98	97

(Positive = strictly positive plus zero CARs)

- / - = Negative at Announcement and Negative over A-C interval

- / + = Negative at Announcement but Positive over A-C interval

+ / - = Positive at Announcement but Negative over A-C interval

+ / + = Positive at Announcement and Positive over A-C interval

For purposes of exposition, the comparisons are restricted to only three versions of the announcement period CAARs, (-1,1), (-1,5), and (-1,10). The findings demonstrate extensive revisions of the market's initial judgement, with a change in sign for approximately 33 per cent of bidders. This confirms the findings of earlier studies, (see, for example Asquith, 1983 and Limmack, 1991), that the interval between announcement and completion is indeed rich with information that impacts on the collective wisdom of the market. A simple examination of the descriptive statistics for the A-C interval suggests that the conduct of the bidding process, the extent of new information flows, and time for reflection could be very different from case to case. The mean interval is 33.8 days and the median value 31 days, with a standard deviation of 14.15 days, and the simple correlation between the CAAR^{a-c} and A-C interval is only -0.344. The extent of the reversal in fortunes for some bidding firms suggests that CAAR^{a-c} might well be a more reliable indicator of the average gains (losses) to the shareholders of acquiring firms than announcement period CAARs.

5.4 Bidders' Post-acquisition Abnormal Returns

The market model returns to successful bidders in the post-merger period are presented in Table 4.12. Measured on an equally-weighted basis the returns are negative and statistically significant, with only 36 to 40 per cent of bidders showing positive returns, significant at the one per cent level. This is consistent with the market model results from Franks and Harris (1989) for a 12 month post-outcome period, but inconsistent with Limmack (1991), who reports negative, but insignificant returns. The pattern of returns demonstrates a secular negative drift up to 200 days after completion, which is consistent with the pattern of Limmack's results.

On a value-weighted basis, bidder returns are also negative and statistically significant from the ninth day after completion. However, the value-weighted losses are much lower, suggesting that the shareholders of large acquirers do not suffer wealth losses to the same extent as those of smaller firms. This aspect of the value-weighted results is similar to that reported by Limmack (1991), although in his case the value-weighted returns are not significantly different from zero.

Table 4.12

Bidders' Equally-Weighted & Value-Weighted Market Model Cumulative Average
Abnormal Returns Relative to Completion Date for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(0,1)	-0.002 ^b	40 ^a	2.08	0.000	40 ^a	0.16
CAAR(0,2)	-0.004 ^b	38 ^a	2.02	0.000	38 ^a	0.12
CAAR(0,3)	-0.003 ^c	39 ^a	1.50	0.000	39 ^a	0.15
CAAR(0,4)	-0.003 ^c	40 ^a	1.52	0.000	40 ^a	0.91
CAAR(0,5)	-0.004 ^b	40 ^a	2.01	-0.001	40 ^a	0.99
CAAR(0,6)	-0.007 ^a	40 ^a	3.50	0.000	40 ^a	0.90
CAAR(0,7)	-0.009 ^a	40 ^a	3.00	-0.001	40 ^a	0.98
CAAR(0,8)	-0.001 ^a	38 ^a	3.67	-0.002 ^b	38 ^a	2.03
CAAR(0,9)	-0.011 ^a	38 ^a	3.67	-0.002 ^b	38 ^a	2.05
CAAR(0,10)	-0.012 ^a	37 ^a	4.00	-0.002 ^b	37 ^a	1.98
CAAR(0,15)	-0.015 ^a	38 ^a	3.75	-0.002 ^b	38 ^a	2.00
CAAR(0,20)	-0.024 ^a	37 ^a	4.80	-0.004 ^b	37 ^a	2.03
CAAR(0,25)	-0.029 ^a	38 ^a	4.83	-0.006 ^a	38 ^a	3.11
CAAR(0,30)	-0.035 ^a	37 ^a	5.83	-0.006 ^a	37 ^a	3.00
CAAR(0,40)	-0.046 ^a	38 ^a	5.75	-0.007 ^a	38 ^a	3.54
CAAR(0,50)	-0.052 ^a	38 ^a	5.78	-0.007 ^a	38 ^a	3.49
CAAR(0,60)	-0.064 ^a	40 ^a	6.40	-0.008 ^a	40 ^a	2.64
CAAR(0,70)	-0.069 ^a	37 ^a	6.27	-0.009 ^a	37 ^a	3.00
CAAR(0,80)	-0.079 ^a	36 ^a	6.08	-0.012 ^a	36 ^a	3.02
CAAR(0,90)	-0.085 ^a	38 ^a	6.07	-0.011 ^a	38 ^a	2.75
CAAR(0,100)	-0.097 ^a	38 ^a	6.47	-0.013 ^a	38 ^a	3.21
CAAR(0,110)	-0.110 ^a	36 ^a	6.88	-0.013 ^a	36 ^a	3.25
CAAR(0,120)	-0.123 ^a	38 ^a	7.23	-0.013 ^a	38 ^a	3.25
CAAR(0,130)	-0.131 ^a	37 ^a	7.28	-0.014 ^a	37 ^a	3.52
CAAR(0,140)	-0.141 ^a	36 ^a	7.42	-0.015 ^a	36 ^a	3.76
CAAR(0,150)	-0.151 ^a	36 ^a	7.55	-0.016 ^a	36 ^a	4.03
CAAR(0,160)	-0.165 ^a	36 ^a	7.50	-0.018 ^a	36 ^a	4.52
CAAR(0,170)	-0.178 ^a	35 ^a	7.74	-0.018 ^a	35 ^a	3.60
CAAR(0,180)	-0.191 ^a	36 ^a	7.96	-0.018 ^a	36 ^a	3.62
CAAR(0,190)	-0.197 ^a	36 ^a	7.58	-0.019 ^a	36 ^a	3.81
CAAR(0,200)	-0.211 ^a	36 ^a	7.81	-0.020 ^a	36 ^a	4.00

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

The market-adjusted model results are slightly less clear-cut and of a different order of magnitude than those for the market model, and so in this instance they are reported in Table 4.13. On an equally-weighted basis, bidders suffer a loss of around 5 per cent after 200 days post-completion, with statistically significant losses occurring from day 9. This contrasts with the market model losses which were much larger and statistically significant throughout. Although the market-adjusted results show more than 50 per cent of firms with positive returns from day 3 through day 5, for all other measurement intervals fewer than 44 per cent of bidders have positive returns. The value-weighted returns are also negative, statistically significant from day 15, but again considerably smaller than the market model. Unlike the market model, the value-weighted losses are considerably lower than the equally-weighted measures.

Differences in abnormal returns generated by the two benchmarks are similar to those found by Franks and Harris (1989). In their case the differences are substantial with the CAPM and market-adjusted model producing positive and significant returns, compared to negative and significant returns for the market model. Franks and Harris attribute these differences to a positive market model intercept of one per cent per month for the average bidder. This, they suggest, is evidence that in their sample bidders out-performed the market by a considerable margin in the pre-announcement period. In such circumstances, they argue, using the estimated market model α to assess post-outcome performance will lead to a negative bias in post-outcome abnormal returns.

Limmack (1991) points out that the argument about superior pre-bid performance advanced by Franks and Harris should also apply to his market model results, given his alpha estimate of 0.6 per cent. However, Limmack's alternative benchmarks, the adjusted-beta (obtained from the LBS Risk Measurement Service) and market-adjusted models, both produce negative returns to bidders in the post-outcome period, unlike the Franks and Harris study. Furthermore, Limmack also points to the possibility of an upward bias in the average bidder return, due to successful acquirers themselves becoming targets in the post-outcome period.

Table 4.13

Bidders' Equally-Weighted & Value-Weighted Market-Adjusted Model Cumulative Average Abnormal Returns Relative to Completion Date for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
CAAR(0,1)	-0.001	43 ^a	0.98	0.000	43 ^a	1.02
CAAR(0,2)	-0.002	42 ^a	1.02	0.000	42 ^a	0.98
CAAR(0,3)	0.000	53	0.48	0.000	53	1.00
CAAR(0,4)	0.000	54 ^c	0.45	0.000	54 ^c	0.90
CAAR(0,5)	0.000	56 ^b	0.42	0.000	56 ^b	0.94
CAAR(0,6)	-0.002	42 ^a	1.03	0.000	42 ^a	0.90
CAAR(0,7)	-0.003	42 ^a	1.00	-0.001	42 ^a	1.00
CAAR(0,8)	-0.005 ^b	41 ^a	1.67	-0.001	41 ^a	1.02
CAAR(0,9)	-0.004 ^c	40 ^a	1.33	-0.001	40 ^a	0.95
CAAR(0,10)	-0.004 ^c	41 ^a	1.34	-0.001	41 ^a	1.00
CAAR(0,15)	-0.004	40 ^a	1.03	-0.002 ^b	40 ^a	2.03
CAAR(0,20)	-0.009 ^b	41 ^a	1.81	-0.003 ^a	41 ^a	3.02
CAAR(0,25)	-0.010 ^b	40 ^a	2.04	-0.004 ^b	40 ^a	2.00
CAAR(0,30)	-0.012 ^b	40 ^a	2.00	-0.004 ^b	40 ^a	2.01
CAAR(0,40)	-0.015 ^b	43 ^a	2.14	-0.005 ^a	43 ^a	2.48
CAAR(0,50)	-0.012 ^c	42 ^a	1.56	-0.003 ^c	42 ^a	1.50
CAAR(0,60)	-0.014 ^b	43 ^a	1.75	-0.004 ^c	43 ^a	1.33
CAAR(0,70)	-0.011	44 ^a	1.22	-0.005 ^b	44 ^a	1.68
CAAR(0,80)	-0.012	44 ^a	1.20	-0.006 ^b	44 ^a	2.12
CAAR(0,90)	-0.011	42 ^a	0.98	-0.005 ^b	42 ^a	1.66
CAAR(0,100)	-0.015 ^c	42 ^a	1.36	-0.006 ^b	42 ^a	2.02
CAAR(0,110)	-0.021 ^b	42 ^a	1.75	-0.006 ^b	42 ^a	2.00
CAAR(0,120)	-0.027 ^b	41 ^a	2.26	-0.005 ^b	41 ^a	1.70
CAAR(0,130)	-0.025 ^b	42 ^a	2.08	-0.005 ^b	42 ^a	1.65
CAAR(0,140)	-0.028 ^a	42 ^a	2.34	-0.005 ^b	42 ^a	1.68
CAAR(0,150)	-0.030 ^b	42 ^a	2.31	-0.006 ^b	42 ^a	2.00
CAAR(0,160)	-0.036 ^a	44 ^a	2.77	-0.006 ^b	44 ^a	2.02
CAAR(0,170)	-0.043 ^a	43 ^a	3.07	-0.006 ^b	43 ^a	1.98
CAAR(0,180)	-0.049 ^a	44 ^a	3.26	-0.006 ^b	44 ^a	2.01
CAAR(0,190)	-0.048 ^a	44 ^a	3.20	-0.005 ^b	44 ^a	1.67
CAAR(0,200)	-0.053 ^a	42 ^a	3.53	-0.006 ^b	42 ^a	2.01

N=559 ^a ^b ^c significant at 1, 5, and 10 per cent levels

Two further UK studies, although not directly comparable with the present study because of differences in benchmark technology, offer additional support for negative post-outcome returns to successful bidders. Using a size-adjustment technique, Kennedy and Limmack (1996) report negative returns, significantly greater than zero. Gregory (1997) tests a total of seven benchmarks with UK data and again reports negative acquirer returns.

These results are off-set to some extent by the findings from Higson and Elliott (1998), who use a size-adjusted holding period benchmark. They report positive returns on a value-weighted basis, but also report negative, although insignificant, equally-weighted returns. However, the sign of their results varies depending on the sample sub-periods under consideration. This time variation has a resonance with the findings from a US study by Agrawal *et al.* (1992) and will be taken up as an important issue in Chapter 6.

5.5 Net Cash Wealth Effects

When measured by abnormal returns the evidence shows that targets in the sample made substantial and significant gains, whereas bidders suffered small, but statistically significant losses. Because of the size disparity between target and bidder firms, these results present two questions. First, are the wealth effects positive overall? Second, if positive, do target shareholders gain at the expense of bidder shareholders?

The wealth effects in cash terms are presented in Table 4.14. They are computed by taking the market value of equity from the *Datastream* database 60 days prior to announcement and multiplying this by the appropriate abnormal returns. The panels, A, B, C represent the wealth gains (losses) calculated for three event windows: pre-bid to announcement; announcement period; and the A-C interval.

Regardless of the measure used, the average net wealth effects of mergers and acquisitions in the sample is positive, although the magnitudes vary considerably from a maximum of £13.073 million when the abnormal returns are measured over the (-1,+5) window, to only £1.959 million when the basis is the full A-C interval. The positive wealth gains are statistically significant for the first two measures, but insignificant when measured over the full A-C interval.

Table 4.14

Shareholder Wealth Gains/Losses in £ millions to Bidders, Targets, and to Matched Pairs

	Mean	T-value	%+	1st Q'tile	Median	3rd Q'tile
<i>Panel A: Wealth Gains measured from day -60 to day +5</i>						
Bidders	-10.751 ^b	2.184	44 ^a	-15.391	-1.087	7.241
Targets	19.389 ^a	8.598	94 ^a	2.290	12.797	21.170
Combined	8.638 ^c	1.959	67 ^a	-5.332	8.921	24.721
<i>Panel B: Wealth Gains measured from day -1 to day +5</i>						
Bidders	-7.027 ^a	2.667	31 ^a	-10.144	-1.357	0.447
Targets	20.101 ^a	7.728	96 ^a	2.311	17.973	24.973
Combined	13.073 ^a	4.315	33 ^a	-1.615	5.309	18.057
<i>Panel C: Wealth Gains measured over the Announcement to Completion Interval</i>						
Bidders	-11.456 ^b	2.236	45 ^b	-11.147	-0.647	2.028
Targets	13.414 ^a	5.484	95 ^a	1.053	6.755	8.944
Combined	1.958	0.529	64 ^a	-4.713	3.349	10.172

N=559 ^{a b c} significant at 1, 5, and 10 per cent levels

For all three measures the wealth changes for targets are substantial and significant, whereas bidders suffer substantial and significant losses. It would appear, therefore, that targets make at least some of their gains at the expense of the shareholders of bidder firms. Furthermore, if the transactions costs suffered by bidders were to be included in the wealth consequences, the picture would be even more serious, (Kay, 1988).

These results are consistent with Firth (1980) and Limmack (1991), but are at odds with some of the results from Franks and Harris (1989), who show both targets and bidders making £ gains when the basis is measured over (-4,+1) months, but small £ losses to bidders in the announcement month 0.

As Cowling *et al.* (1980) and Limmack (1991) have pointed out, £ gains do not necessarily imply efficiency gains from takeover activity. However, £ losses would certainly suggest that the

market, on average, regards such activity as value reducing for acquirers, with adverse implications likely for the firms involved.

6 THE IMPACT OF RELATEDNESS

So far the analyses have treated acquisitions as homogeneous. However, one characteristic, the degree to which the business lines of targets and bidders are related has an obvious resonance for both regulation and strategic management. In this section the sample is divided into two groups, related and unrelated acquisitions, and the share price data is re-examined to test whether the degree of relatedness has an impact on the returns to bidder shareholders.

The individual pairs of bidders and targets were classified as related or unrelated according whether they were in the same industrial sector as defined by the Stock Exchange Industrial Classification provided by the *Datastream* database. This is roughly equivalent to the 2-digit level in the Standard Industrial Classification.

The data analysis is preceded by a brief review of the main theoretical strands and viewpoints that have been advanced about the relatedness issue.

6.1 Relatedness, a Review of the Theoretical Contributions

As is often the case in various strands of the strategic management literature, the received wisdom on the relatedness issue has varied over time.¹⁶ Earlier work, characterised by the contributions of Chandler (1962) and Williamson (1975) suggested that corporate organisational forms based on divisionalised structures might provide a sound basis for corporate expansion via a strategy of diversified acquisitions. A major rationale for strategy suggested that the detailed information held by corporate headquarters and not available to capital markets, allowed the corporate form to act as a more efficient allocator of capital. In addition, diversification could deliver benefits by smoothing cash flows via the integration of less than perfectly positively correlated returns from unrelated businesses.

¹⁶ Alternatively, this could be viewed as a debate about the value impacts of diversification strategies.

If there was a certain *ad hoc* rationalisation involved in this work it would not be surprising, given that it evolved largely in the US, where the anti-trust regime had virtually outlawed horizontal mergers and had also adopted an extremely tough stance in respect of vertical integration. For US management teams intent on rapid growth strategies, unrelated acquisitions were virtually the only outlet (Shleifer and Vishny, 1991).

More recently, there has been shift away from diversification by writers on business strategy, with contributions suggesting that corporate management teams should return to 'core competences' and their 'core business' (for example, Porter, 1985, 1987; Kay, 1995). In addition, the advent and growing influence of modern finance theory (and portfolio theory in particular) added weight to the strategic arguments. The finance literature raised questions about the intended beneficiaries of corporate diversification, suggesting that managers and not shareholders stood to gain the most from such strategies.

Put simply, finance theory suggests that managers who wish to maximise shareholder wealth must have regard to the investment opportunities of their shareholders. In particular, firms should only attempt to do for shareholders, that which shareholders cannot do for themselves. Clearly what shareholders can do for themselves is diversify their investments to moderate risk and, what is more, they are likely to be able to do so more efficiently and effectively in financial assets, than firms are able to do in productive assets.¹⁷ Therefore, in the context of modern portfolio theory, the value of conglomerate acquisitions to shareholders is at the very least questionable, (Copeland and Weston, 1992; Shleifer and Vishny, 1991). In contrast, the ability of corporate managers to diversify their human capital is generally severely limited. Thus diversification of the assets that they control might represent an attractive way to ameliorate the risk to that human capital, even if it brings little or no benefit to shareholders, (Amihud and Lev, 1981). It has been argued that such non-maximising behaviour is most likely to be practised (though not exclusively) by management teams who find themselves operating in declining

¹⁷ An interesting and robust statement that summarises the modern finance view about these matters, comes from a well-known and important shareholder in the US, Warren Buffet: 'Diversification is a protection against ignorance. It makes very little sense for those who know what they are doing'. (Quoted in the *The Guardian*, 3 May 1997.)

industries, (Donaldson and Lorsch, 1983).

Against this it could be argued that, in principle, unrelated acquisitions can serve to reduce systematic risk and the cost of capital, but, as Limmack and McGregor (1995) have pointed out, some management theorists (for example, Porter, 1985) have argued that reduction in systematic risk is a much more complex issue and that related acquisitions might well provide better opportunities than diversification.

Furthermore, managerial theories of the firm (for example, Baumol, 1967; Marris, 1964) suggest that growth strategies benefit managers, but might not deliver unalloyed benefits to shareholders. Jensen (1986) has suggested that growth via unrelated acquisitions in particular is likely to be symptomatic of management teams with limited investment opportunities squandering free cash flow, rather than returning it to shareholders. In other words, growth by acquisition, and particularly (unrelated) acquisitions, might give rise to agency problems, rather than resolve them as would be suggested by the disciplinary hypothesis.

It has also been argued that management teams of related bidders are likely to be in a better position to *recognise* underperformance in a potential target and the opportunities for profitable synergies. This information advantage should also mean that related bidders are also in a better position to value the target's assets more accurately and thus better equipped to avoid paying too high a premium for control, (Chatterjee and Lubatkin, 1990; Morck *et al.*, 1990; Dickie *et al.*, 1987). However, Barney (1988) has argued that relatedness is not a sufficient condition for acquirers to achieve wealth gains for shareholders, and that either private, inimitable, or unexpected synergies must exist between the related bidder and target. Further, Hughes (1989) has suggested operational and organisational reasons why related acquisitions might not yield the benefits suggested elsewhere in the literature.

The UK empirical evidence on the relatedness issue is far from conclusive. Sudarsanam *et al.* (1996) did find some impact for relatedness, but only for part of their sample. Limmack (1990) was unable to find any systematic impact for relatedness on shareholder wealth effects, whereas Limmack and McGregor (1995) showed that unrelated acquisitions performed better than related

acquisitions. A similarly confused picture also emerges from UK studies with accounting data, (for example, Cosh *et al.*, 1980; Meeks, 1977). However, evidence from the divestment and management buy-out literature suggests that a reversal of diversification can bring benefits to both the divester and the newly formed firms, (Wright *et al.*, 1993).

On the whole, US studies have generally found more support for the relatedness hypothesis, although even here there is a deal of contradictory evidence. For example, Lahey and Conn, (1990), Scanlon *et al.*, (1989), and Sicherman and Pettway, (1987) all find that related or horizontal acquisitions provided better wealth effects than unrelated or conglomerate acquisitions. However, Elgers and Clark (1980), Kusewitt (1985), and Lubatkin (1987) all find superior wealth effects for unrelated acquisitions. Finally, Morck *et al.* (1990) produce results which suggest that the date of acquisition might play a role in influencing the returns to related acquisitions. In a similar vein Shleifer and Vishny (1991) in their review of this issue contend that the evidence suggests that benefits that might have accrued to conglomeration during the 1960s and 1970s were very clearly reversed in the 1980s.

6.2 Event Study Tests of the Relatedness Hypothesis

The relatedness hypothesis was tested by dividing the sample of bidders into related and unrelated groups and analysing the cumulated the respective abnormal returns. The results are set out in Table 4.15.¹⁸

The returns to the two groups of bidders are very similar, both suffering statistically significant losses on an equally-weighted and a value weighted bases. The group means for each CAAR were subjected to an F-test, which proved insignificant. On the basis of the non-parametric binomial test, the proportion of negative returns was greater by approximately 10 per cent for bidders involved in unrelated acquisitions. This is suggestive, perhaps, but overall the results seem to give little reason for thinking that unrelated bidders suffer greater losses than bidders in related acquisitions. This result is consistent with other recent UK studies, (Limmack, 1990;

¹⁸ The full range of event windows used earlier was also employed for the relatedness tests, but as none was out of line with those for the announcement period and announcement to completion event windows, it is only the latter two that are reported.

Sudarsanam *et al.*, 1996), which could not discern any significant difference between merger types. However, they are inconsistent with Limmack and McGregor, (1995) who showed that on balance unrelated acquisitions fared better than related acquisitions.

Table 4.15

Equally-weighted and Value-weighted Market Model Cumulative Average Abnormal Returns for Bidders in Related & Bidders in Unrelated Acquisitions (i) Relative to Announcement Date, (ii) over Announcement to Completion Interval, for Sample Period 1980-90

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	T-value	Mean	%+	T-value
<i>Panel A: Related Bidder Returns relative to Announcement Date</i>						
CAAR(-1,1)	-0.019 ^a	42 ^a	4.75	-0.018 ^a	42 ^a	3.03
CAAR(-1,5)	-0.023 ^a	44 ^a	4.61	-0.024 ^a	44 ^a	2.98
CAAR(-1,10)	-0.019 ^a	41 ^a	3.80	-0.023 ^a	41 ^a	2.67
CAAR(-1,15)	-0.024 ^a	44 ^a	4.02	-0.020 ^a	44 ^a	2.53
CAAR(-1,20)	-0.027 ^a	42 ^a	3.86	-0.021 ^a	42 ^a	2.58
<i>Panel B: Related Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.038 ^a	42 ^a	4.22	-0.018 ^b	42 ^a	1.68
<i>Panel C: Unrelated Bidder Returns relative to Announcement Date</i>						
CAAR(-1,1)	-0.017 ^a	32 ^a	4.26	-0.021 ^a	32 ^a	3.33
CAAR(-1,5)	-0.021 ^a	31 ^a	5.23	-0.026 ^a	31 ^a	3.06
CAAR(-1,10)	-0.019 ^a	32 ^a	4.78	-0.028 ^a	32 ^a	2.54
CAAR(-1,15)	-0.024 ^a	32 ^a	3.98	-0.025 ^a	32 ^a	3.09
CAAR(-1,20)	-0.026 ^a	33 ^a	3.71	-0.029 ^a	33 ^a	3.06
<i>Panel D: Unrelated Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.032 ^a	37 ^a	4.03	-0.038 ^a	37 ^a	3.36

N=559 ^a ^b ^c significant at 1, 5, and 10 per cent levels

4.7 SUMMARY AND CONCLUDING REMARKS

The present study differs from previous UK work in that daily rather than monthly data is used. Daily data has clear advantages because of the precision in respect of event dating (Brown and Warner, 1985), and because it permits more narrowly focussed event windows which is more in keeping with the requirements of the event study technique, (Fama, 1991).¹⁹

The empirical results confirm the universal finding that targets make economically substantial and statistically significant gains in the order of 18 per cent around bid announcement. This is in contrast to the experience of successful bidders, who suffered statistically significant losses of approximately 2.5 per cent at announcement, around 3 per cent over the full A-C interval, and up to 21 per cent 200 days post-acquisition. In cash terms, M&A activity enhanced combined shareholder wealth, on average, by £1.959 million over the A-C interval. However, this figure consisted of an average £13.414 million gain for target shareholders, realised at the expense of bidder shareholders who, on average, suffered a wealth loss of £11.456 million, (ignoring transaction costs of acquisition).

Despite these substantial and significant negative returns suffered by acquiring firms, some caution is probably warranted, particularly in respect of the post-acquisition losses. Problems of measurement error, sample selection bias and risk adjustment could be present in the post-acquisition results, (Jensen and Ruback, 1983: 20).²⁰ Furthermore, interpretation of results based on long event windows, (200 days in this study), not clearly identified with *specific* information events might also be problematic.²¹ Narrow event windows around bid announcement do not suffer from this handicap, but, as argued above, it is also problematic to represent announcement period returns as the market's full and final judgement about the economic consequences of a

¹⁹ Sudarsanam *et al.* (1996) also used daily data, but they chose to employ long event windows, (-40, 40), more in keeping with association studies.

²⁰ Even so, it has yet to be demonstrated definitively that these problems are the root cause of negative post-acquisition drift in the returns to acquiring firms, (Gregory, 1997; Higson and Elliott, 1998).

²¹ As Strong (1992: 359) argues, strictly speaking share-price studies over such a period should be labelled as *association* studies.

subsequently successful takeover bid.

Jensen and Ruback expressed concern that the post-acquisition drift was 'unsettling' because, if valid, it would be 'evidence of market inefficiency'. This concern was countered by the arguments advanced earlier which suggested that post-acquisition drift need not imply market inefficiency if the rational expectations perspective advanced by Donto *et al.* (1995) is adopted. Neither is market inefficiency implied if price changes are interpreted as reactions to new information about the implementation of the acquisition. The foreshortening of the post-outcome window in the present study facilitates the acceptance of such an interpretation, as opposed to the two or three year windows utilised in previous studies. However, it is appropriate to point out that these arguments are not entirely consistent with the work of Agrawal *et al.* (1992), who argued that the persistence of post-merger losses to acquiring firms do not 'seem' to be the result of 'a slow adjustment of the market to the merger event'. In contrast Limmack (1991) suggested that his value-weighted results could be interpreted this way.

Despite some reservations, it seems reasonable to conclude that, on average, for the period 1980-90, mergers and acquisitions did not represent positive net present value projects for acquiring firms. To the extent that the work of this chapter represents an indirect test of the management displacement hypothesis, the results presented would lead to the rejection of the null hypothesis. In the context of UK merger policy the results suggest that explicit reliance on the market for corporate control as a discipline against underperformance by corporate management teams is not warranted. However, the fact that there was little difference between the returns to related and unrelated acquirers suggests that the market does not anticipate substantial gains being achieved via enhanced market power.

Despite the wish of Franks and Harris (1989) '[to] resolve the conflicting evidence in the UK', the present study has produced evidence which suggests that the issue is far from resolved; a conclusion echoed in other recent UK event studies, (Limmack, 1991; Kennedy and Limmack, 1996; Sudarsanam *et al.*, 1996; Gregory, 1997).

In the next chapter the disciplinary hypothesis will be subjected to a more direct test with the use

of accounting data. In particular the hypothesis that more efficient firms take over the less efficient will be tested by comparing the financial characteristics of acquirers and targets. The relatedness hypothesis will also be re-examined with accounting data.

CHAPTER 5

The Disciplinary Hypothesis: Tests with Accounting Data

1. INTRODUCTION

In the previous chapter the disciplinary or management displacement hypothesis was subjected to an indirect test via event study methodology. The takeover discipline is predicated, of course, on the assertion that inefficient and ineffective management teams are replaced by rival teams that have superior management abilities. If this is so, then, *ceteris paribus*, that superiority should manifest itself in the respective accounting statements published by bidders and targets prior to the announcement of a takeover bid. The main purpose of the chapter is to examine that assertion and to subject the disciplinary hypothesis to further testing via the use of accounting data.

As outlined in Chapter 3, the use of accounting data is not without its difficulties. However, as demonstrated in the previous chapter, problems of thin trading, event induced changes in variance, variations due to benchmarks, contamination of share prices in the pre-bid period due to anticipation, etc. mean that the use of share price data is not wholly unproblematic. Furthermore, unlike share price data, accounting data does at least allow for a direct test of the disciplinary hypothesis and will provide a way of corroborating the event study results.

Despite this, it could be argued, that the use of accounting data represents a return to an earlier and outmoded research technology. As already noted in Chapter 2, the 1980s witnessed a major shift in the research paradigm, with the event study displacing studies based on accounting data almost entirely.¹ Nevertheless, that paradigm shift has yet to produce a completely consistent and

¹ A notable exception was the contribution from Ravenscraft and Scherer (1989) in the US.

wholly convincing body of evidence in respect of UK acquirers, even though there have been many refinements and improvements in the event study technology. Therefore, following the injunction of Bradley (1987) it seems appropriate to combine research techniques in the search for a more robust set of results.

In additions to these arguments, there can be little doubt that corporate management teams give considerable regard to and act upon accounting data. If mergers and acquisitions are regarded as investment decisions, then the capital budgeting literature demonstrates the prominence of measures such the accounting rate of return as an investment criterion, (Jones, 1986; McIntyre and Coulhurst, 1985; Pike, 1988).

Grinyer (1980) presents a theoretical model which suggests that a pure wealth maximisation objective is unlikely to be the sole management objective in investment decisions.² This receives support from Francis (1980) who reveals an over-riding concern on the part of management teams for short-term earnings in capital budgeting situations. A short-term focus is also supported with empirical evidence from Statman and Sepe (1984) in the US, and from Pike (1985) in the UK. The managerial preoccupation with accounting earnings and the short-term has also been given theoretical support and shown to be perfectly rational and expected behaviour, (Kee and Bubnitz, 1988; Statman, 1982).

In an examination of capital budgeting practice via a survey of 100 leading UK firms, Pike and Ooi (1988) reported that the majority of senior managers regarded accounting profitability and earnings measures as more important than measures of shareholder wealth. Whilst their longitudinal survey from 1980 to 1986 shows an increasing regard for the latter, at the same time the importance of growth in earnings per share increased at a much faster rate.³ Paradoxically perhaps, Pike and Ooi suggest that the increased use of performance-related compensation packages for senior managers, rely mostly on accounting measures of performance which

² This will be examined in more detail in Chapter 6 below.

³ Pike and Ooi (1988) report that in 1980 19.8% of senior managers said that shareholder wealth was a 'very important' financial objective, whereas in 1986 the figure had risen to 45.7%. The comparable returns for the financial objective growth in earnings per share were 9% in 1980 and 56.3% in 1986.

probably accounts for increased managerial focus on earnings per share and other accounting measures. Pike and Ooi (1988:167-68) summarise their findings in the following way:

'... the significant positive association between the EPS goal and the use of accounting rate of return to assess capital projects may indicate that senior managers with compensation schemes linked to earnings growth are particularly interested in accounting returns, even if at the expense of shareholders' wealth.'

These findings receive support from a recent UK survey by Coates *et al.* (1996), who suggest that accounting measures of performance and earnings can play an important role in management incentive schemes. Also Pike (1996) demonstrates clearly that although the use of discounted cash flow (DCF) techniques has increased over time, they have not replaced non-DCF techniques, but merely supplemented them.

In the specific context of mergers and acquisitions, recent UK evidence suggests that shareholder wealth is not the top management priority. In a survey of 146 chief executives drawn from 550 of the most merger-active firms, Ingham *et al.* (1992) reported that accounting earnings were typically preferred to share price reactions as a managerial measure of success or failure.

In the light of this sort of evidence, it seems probable that the decisions of management teams in respect of mergers and acquisitions are, at least to some extent, informed by and driven by the expected consequences in terms of accounting earnings. That being so, then it seems entirely appropriate to examine the accounting data for targets and acquirers. Rather than representing competing and mutually exclusive methods of empirical testing, accounting studies and event studies are potentially complementary approaches, with their combined use offering at least the possibility of mutually reinforcing insights.

The remainder of the chapter is organised as follows. Section two describes the data sample, which is then subjected to an exploratory, univariate analysis in section three, which also highlights the drawbacks and deficiencies of the univariate approach. Section four begins with a brief discussion of the multivariate alternatives available and goes on to describe how principal components factor analysis is combined with logistic regression to produce the preferred

technique in the attempt to discriminate between the pre-bid performances of targets and bidders. Section five combines the event study results from the previous chapter with logistic regression results described below. Section six examines the relatedness hypothesis with accounting data, and the final section presents a brief summary and concluding remarks.

2. DESCRIPTION OF THE DATA

The construction of the data sample has already been described in the previous chapter, (see section 4.3). This section explains the collection of the accounting data. Once again the *Datastream* database was utilised and accounting data items were collected for each firm in the sample. These data items were chosen to proxy a number of attributes or dimensions of economic performance and financial position, including: profitability; cash flow; financial leverage; liquidity; asset utilisation; growth opportunities. The data are described in Table 5.1.

In the first instance the data were collected for the five year period prior to bid announcement. However, problems of missing data caused a substantial reduction in the number of cases in the sample and so this was shortened to three years to arrive at a sample of 559 matched bidders and their respective targets. Three years should be sufficient to capture a reasonable picture of pre-bid performance, and is consistent with earlier accounting studies in the UK, (for example, Singh, 1975; Meeks, 1977).

In order to correct for sector or industry specific influences and also to be able to test the strong form of the MDH, whereby bidders are assumed to have globally superior management skills, *Datastream* was also used to construct appropriate industry or sector indices for each variable. The industries or sectors were those defined by the Stock Exchange Industrial Classification (SEIC), which approximates the 2-digit level of the Standard Industrial Classification. The sector indices were constructed by computing the mean value for each variable for all firms held by *Datastream* in each sector. The SEIC sector indices were obtained for each calendar year over the sample period and these were then used to standardise the variables for each bidder and target firm. The standardised variables thus consist of the ratio of unadjusted variable by the sector mean for the appropriate calendar year.

Table 5.1Accounting Variables extracted from the *Datastream* Database.

Label	Variable Name	Variable Description
ROE	Return on Shareholders' Equity %	net profits earned for ordinary shareholders (adjusted for extraordinary and exceptional items) divided by equity capital plus reserves minus intangibles.
ROC	Return on Long-term Capital %	pre-tax profits plus total interest charges divided by total share capital and reserves plus total loan capital.
TPM	Trading Profit Margin %	trading profit from normal activities before depreciation, interest charges and provisions, divided by total sales from normal trading activities.
OPM	Operating Profit Margin %	trading profit minus depreciation divided by sales from normal trading activities.
NPM	Net Profit Margin%	after-tax profit divided by sales from normal trading activities.
CFM	Cash Flow Margin %	net profits earned for ordinary shareholders (adjusted for extraordinary and exceptional items) plus depreciation, interest charges and tax, divided by sales from normal trading activities.
TAE	Turnover/Assets Employed	sales from normal trading activities divided by total assets minus short-term borrowings.
GEAR	Gearing Ratio	preference and loan capital divided by equity capital and reserves.
WCR	Working Capital Ratio	total current assets divided by total current liabilities
OPE	Operating Profit per Employee	operating profit adjusted for exceptional and extraordinary items divided by the total number of employees
BOOK	Book value of equity	ordinary share capital plus reserves
SIZE	Net Assets	net fixed assets plus net current assets
PER	Price-Earnings Ratio	firm's share price 40 days prior to bid announcement (and in annual increments from that date) divided by the earnings per share (adjusted for extraordinary and exceptional items)
POR	Dividend Payout Ratio %	total annual dividend divided by the annual earnings attributable to the ordinary shareholders
MVAL	Market Value of Equity	market value of Equity 40 days prior to bid announcement
MTB	Market to Book Ratio	MVAL divided by BOOK

3. UNIVARIATE ANALYSIS

This section presents an initial examination of the accounting and financial characteristics data and some rudimentary tests of the MDH, via a series of univariate *t*-tests. These are used to search for statistically significant differences in the characteristics of acquirers and targets. While the weakness of these statistical procedures is acknowledged, the results generated do allow comparison with earlier UK studies, (for example, Singh, 1971, 1975; Meeks, 1977; Cosh, *et al.*, 1980; Cosh *et al.*, 1989; Levine and Aaronovitch, 1981; Kuehn, 1984; Ravenscraft and Scherer, 1989). They also provide a useful first approximation in preparation for the multivariate tests used later.

3.1 Performance Measurement and Variable Choice

Accounting data offers a number of performance measures that could be used to test the MHD. All have some merit, but also suffer from various drawbacks. If shareholder wealth maximisation is considered to be the sole maximand, then return on shareholders' equity (ROE) would seem to be an appropriate measure. However, in addition to the general susceptibility of all accounting measures to manipulation and bias, ROE can also be influenced substantially by changes in financial gearing. In which case return on long-term capital (ROC) might be considered more appropriate. It has the merit of not being influenced by gearing changes and provides a somewhat wider measure of performance.

An alternative to a profit measure relative to the asset base would be to measure profitability against revenue. For example, the trading profit margin (TPM) or the cash flow margin (CFM) might both allow a useful measure of management's ability to contain basic unit costs and extract revenue. Alternatively, operating profit margin (OPM) and net profit margin (NPM) might give better measures of the ability of manage the total cost base, including tax charges, although they are, perhaps, more open to manipulation and bias. Other measures that might also prove useful include asset turnover (ATE) and operating profit per employee (OPE).

Unfortunately, theory does not offer any obvious or definitive way of making a definitive choice between these various measures. A number of writers have suggested that in practice one profit

measure or another is more or less appropriate, although in the final analysis the choice seems largely arbitrary. For example, Rappaport (1986) suggests that in the effort to enhance shareholder value, management teams should have particular regard to 'value drivers'. Rappaport claims that one of the most important of these drivers is the operating profit margin.

Tobin's Q, the ratio of market value of assets to their replacement cost has also been suggested as an appropriate measure, particularly in the context of acquisitions, (Hasbrouk, 1985; Jensen, 1986). Due to the lack of published replacement cost data, the market to book ratio (MTB) has often been used as a substitute for Tobin's Q, (for example, Sudarsanam *et al.*, 1996). It also has an established pedigree in the practical world of financial analysts and advisers, where it is used to measure performance and growth prospects, (see, for example, PA Consulting Group, 1994).

For the present purposes, ROE and MTB could be seen as the best analogues of the share price return or shareholder wealth effects. However, as argued above, other accounting measures such as ROC might well provide more stable measures of management performance with respect to assets in place. Without a clear theoretical preference for the adoption of one particular performance measure over another, the univariate tests were conducted across a broad range of measures. These results are set out below.

3.2 Univariate Results

In this section, the financial characteristics of bidders and targets are examined for the full sample period, 1980-90. The differences in bidder and target group means are calculated for thirteen variables and then subjected to *t*-tests against the null hypothesis of equality of group means.

Two forms of the variables were used in these *t*-tests. First, the unadjusted accounting ratios constructed from the raw data published by *Datastream*; and second industry-adjusted variables, where each variable for each firm was standardised by the mean for the appropriate industry

sector.⁴ An industry adjustment is the preferred form, since it allows for tests of both versions of the displacement hypothesis. Nevertheless, the unadjusted ratios are included because of potential bias that arises due firms with extreme levels of diversification, (Hill, 1983), and to allow comparison with some of the earlier studies.

The analysis is conducted for one year immediately prior to the bid announcement and for the average of the three accounting periods prior to a bid. This provides for an examination of the relative performances of bidders and targets in the immediate run-up to the bid and also over a longer period.⁵ Whilst some degree of 'window-dressing' of the published accounts might be possible for a year or so, (and both bidders and target managements might have incentives to engage in this behaviour), this should be more difficult to sustain over three consecutive years. The three-year averages might be more reliable for the current purposes: but the financial performance of bidders and targets immediately prior to bid announcement could be influential and it is also included in the analysis. The results of the *t*-tests on the unadjusted ratios are presented in Table 5.2.

In the final year before bid announcement, Panel A, bidders outperform targets for all but one of the profitability and cash flow measures, but only in the case of return on equity is the difference statistically significant. The difference in financial leverage is also significant and shows that bidders are, on average, forty-five per cent more highly geared than targets. Targets performed better in terms of operating profits, but the difference is not significant, whereas in terms of asset turnover, working capital ratio, and profit per employee, targets have statistically superior performance. On average, targets paid out more in dividends, had higher price-earnings multiples, and market to book values than bidders and these results were statistically significant. So, in the accounting period immediately prior to bid announcement, the picture of relative performance is rather mixed.

⁴ Using the mean industry value has the advantage of reducing the non-normality of accounting ratios, (Barnes, 1982, 1990; Platt and Platt, 1990), although the median has also been used for this purpose, (Limmack, 1990).

⁵ The price-earnings multiple and the market-to-book ratio are dropped for the longer period because there is no obvious meaning for average values of these variables.

Table 5.2

Univariate Group Differences between Bidders' and Targets' Unadjusted Accounting Variables for Year-end Prior to Bid Announcement and Averaged over 3-year Period Prior to Announcement. Full sample period 1980-90.

	Bidders	Targets	Difference	<i>t</i> -value	<i>p</i> -value
<i>Panel A - Year-end Prior to Bid Announcement</i>					
ROE(1)	15.9219	13.4548	2.4671	3.24	0.001
ROC(1)	19.3569	19.1447	0.2122	0.31	0.754
TPM(1)	13.1457	12.7012	0.4445	0.72	0.470
OPM(1)	9.7873	10.0917	-0.3043	-0.58	0.562
NPM(1)	5.5744	5.3876	0.1869	0.53	0.593
CFM(1)	9.1763	8.9620	0.2143	0.48	0.629
TAE(1)	2.2502	2.4988	-0.2486	-2.24	0.025
GEAR(1)	0.5506	0.3826	0.1680	2.17	0.030
WCR(1)	1.4105	1.5314	-0.1209	-3.64	0.000
OPE(1)	7.1022	12.8214	-5.7191	-3.50	0.000
PER(1)	17.7702	19.2472	-1.04770	-2.42	0.016
POR(1)	0.3624	0.4373	-0.0749	-3.76	0.000
MTB	1.3657	1.9470	-0.5812	-6.78	0.000
<i>Panel B - 3 year Average Prior to Bid Announcement</i>					
ROE(A)	15.1795	13.7394	1.4401	2.24	0.026
ROC(A)	18.8379	19.3235	-0.4856	-0.72	0.473
TPM(A)	12.4453	12.8976	-0.4523	-0.79	0.432
OPM(A)	9.4869	10.0635	-0.5766	-1.10	0.271
NPM(A)	5.0655	5.1887	-0.1232	-0.39	0.696
CFM(A)	8.8417	8.8286	0.0131	0.03	0.975
TAE(A)	2.3422	2.5123	-0.1701	-1.80	0.072
GEAR(A)	0.3998	0.3730	0.0269	1.13	0.257
WCR(A)	1.4240	1.4993	-0.0754	-2.55	0.011
OPE(A)	6.1786	8.7777	-2.5992	-3.76	0.000
POR(A)	0.3441	0.4013	-0.0572	-2.36	0.017

When the same tests are conducted for the 3-year averages, bidders again have a statistically significant superior return on equity. For four of the remaining five profitability measures, targets have slightly better performance, but none of the differences are substantial or statistically significant. Once again, targets show significant superior performance in the activity measures,

TAE(A), WCR(A), and OPE(A), but the gearing difference is no longer statistically significant. The lack of a clear profitability difference between bidders and targets is consistent with some earlier UK studies, (Newbould, 1970; Levine and Aaronovitch, 1981), but inconsistent with others that have shown bidder superiority (Meeks, 1977; Cosh *et al.*, 1980; Holl and Pickering, 1988). The higher dividend payouts of targets, *ceteris paribus* lowers the likelihood of agency problems due to free cash flow.

On the basis of the unadjusted accounting ratios, it would not be possible to conclude much in relation to the MDH, a view that is consistent with the review by Hughes (1993). However, the one feature to come through is that bidders produce a higher ROE, which, if it can be taken as a proxy for shareholder wealth, provides some tentative support for the disciplinary hypothesis. However, industry effects might well obscure the true picture and little should be read into such results, (Hughes, 1993: 46). In Table 5.3 industry effects are accounted for explicitly, with each variable standardised by reference to the appropriate industry mean.⁶

The pattern of results for the industry-adjusted variables in Table 5.3 is very similar to that for the unadjusted counterparts. In the period immediately prior to the launch of an acquisition, bidders show some signs of superiority in respect of all profitability measures, but only the differences for the variables RROE, RTPM, and RNPM are statistically significant. For the standardised measures the deterioration in target performance in the final period year before bid announcement, (compared to the 3-year averages), is striking and consistent with earlier studies (Singh, 1975; Meeks, 1977). It could be that bidders used this deterioration in target performance as the basis to launch a bid. In contrast the differences in the 3-year averages are much smaller and bidder superiority disappears, and targets no longer underperform compared to the industry benchmark. These results are consistent with much of the previous UK evidence, (Meeks, 1977; Levine and Aaronovitch, 1981; Cosh *et al.*, 1989).

⁶ The standardised version of a variable is indicated by a capital 'R' prefix.

Table 5.3

Univariate Group Differences between Bidders' and Targets' Standardised Accounting Variables for Year-end Prior to Bid Announcement and Averaged over 3-year Period Prior to Announcement. Full sample period 1980-90.

	Bidders	Targets	Difference	<i>t</i> -value	<i>p</i> -value
<i>Panel A - Year-end Prior to Bid Announcement</i>					
RROE(1)	1.0598	0.8357	0.2241	4.56	0.000
RROC(1)	1.0308	0.9979	0.0330	0.92	0.358
RTPM(1)	1.0714	0.9862	0.0851	1.71	0.088
ROPM(1)	1.0517	1.0189	0.0328	0.60	0.551
RNPM(1)	1.0920	0.9442	0.1478	2.15	0.032
RCFM(1)	1.0667	0.9964	0.0703	1.35	0.176
RTAE(1)	0.9718	1.0760	-0.1042	-2.22	0.027
RGEAR(1)	1.0161	0.7519	0.2642	4.35	0.000
RWCR(1)	0.9965	1.0492	-0.0527	-2.19	0.029
ROPE(1)	1.1147	1.3269	-0.2121	-0.61	0.539
RPER(1)	0.9695	1.0679	-0.0984	-2.95	0.003
RPOR(1)	0.9253	1.1163	-0.1910	-3.76	0.000
MTB	0.9887	1.004	-0.0017	-1.07	0.198
<i>Panel B - 3 year Average Prior to Bid Announcement</i>					
RROE(A)	1.0694	1.0419	0.0275	0.60	0.548
RROC(A)	1.0292	1.0342	-0.0050	-0.14	0.892
RTPM(A)	1.0591	1.0535	0.0056	0.11	0.909
ROPM(A)	1.0841	1.0917	-0.0076	-0.13	0.898
RNPM(A)	1.0791	1.0104	0.0688	1.02	0.310
RCFM(A)	1.0678	1.0318	0.0359	0.71	0.480
RTAE(A)	1.0116	1.0792	-0.0676	-1.64	0.101
RGEAR(A)	0.9363	0.8222	0.1141	2.13	0.033
RWCR(A)	1.0023	1.0586	-0.0563	-2.58	0.010
ROPE(A)	1.1627	1.2636	-0.1008	-0.36	0.719
RPOR(A)	0.8714	1.1747	-0.3033	-2.62	0.009

The industry-adjusted results also emphasize that bidders are more heavily geared than targets. However, it is not until the year before a bid that on average bidders reach the industry mean level of gearing. In a principal-agent context, financial gearing is often regarded as a form of managerial bonding cost, (Jensen and Meckling, 1976; Jensen, 1986). Thus the increased use of

gearing on the part of bidder management teams, could be interpreted as an indicator that they were more willing to bond themselves to shareholder interests than target managements. However, set against that argument, the target group has a higher propensity to disgorge cash dividends, which, in terms of free cash flow theory, could be an indication of reduced agency problems (Jensen, 1986).

The results for the price-earnings multiple suggests that 40 days before bid announcement, on average, the market valued the earnings streams generated by target firms more highly than those of bidders. This is a result that is not inconsistent with some of the earlier studies that have looked at P-E ratios, (Cosh *et al.*, 1980; Levine and Aaronovitch, 1981). The higher PERs for the target group could be because their earnings were regarded as more reliable and more likely to grow, but the PER measure might be biased upwards due to market expectations about the target status of these firms. This potential for bias receives some weak support from the event study results reported in the previous chapter. Even so, the higher PER for targets suggests that bidders would have been required to pay substantial (and perhaps excessive) premiums in order to acquire the earnings streams of targets, which is clearly inconsistent with a 'bargains' theory of acquisition, (Hughes, 1993).

Even though the univariate results are inconclusive, it is important to recognise that a series of univariate *t*-tests is not very powerful test procedure. This is particularly so when testing an hypothesis about relative business performance, which, by its nature, is multi-dimensional. As Hughes (1993) points out, the findings from univariate comparisons have often been overturned when the variables have been analysed in a multivariate framework. Furthermore, considerable caution has to be exercised when interpreting univariate results given the well-known danger of increasing Type I errors with *t*-tests in series, (incorrect rejection of the null hypothesis, Tabachnick and Fidell, 1983: 28). Nevertheless this exploratory examination of the data suggests sufficient differences between bidders and targets to warrant further examination via multivariate procedures.

4. MULTIVARIATE ANALYSIS

The univariate analysis carried out in the previous section appeared to throw up some potentially interesting differences between targets and bidders, (for example, the consistently superior ROE generated by bidders in the year before a bid). But, as already noted, these univariate results are likely to be unreliable. Fortunately, a number of multivariate techniques are available that offer protection against the sort of Type I errors induced by serial application of *t*-tests. This section begins with an examination of some of these techniques.

4.1 Choice of Multivariate Technique

Multiple discriminant analysis (MDA), has been used extensively in the mergers field, (for example in the US by Stevens, 1973; Hasbrouk, 1985; and in the UK by Singh, 1975; Holl and Pickering, 1988; Levine and Aaronovitch, 1981; Barnes, 1990). In essence these researchers have used MDA to answer two distinct questions. First, is it possible to use the financial characteristics of firms to predict takeover targets? Second, is it possible to discriminate between bidders and targets on the basis of their respective financial characteristics? While both questions are germane to an examination of the disciplinary hypothesis, only the latter is of specific interest in the present study.

It has been known for some time that the application of MDA in the field of economics and finance is not without difficulties, (Eisenbeis, 1977). Nevertheless, in the first instance discriminant analysis was used to allow direct comparison with earlier UK studies. However, none of the discriminant functions tested provided unambiguous results and none offered much improvement over the univariate tests. Discriminatory power was typically low and the best discriminant function performed poorly in terms of total variance explained and only firm size proved to be a consistent discriminator. Poor results with MDA are consistent with earlier UK studies, (for example, Singh, 1975; Levine and Aaronovitch, 1981).

The weakness of the MDA results were not altogether surprising, given the requirements of the data and the restrictive set of assumptions that underpin that technique. Specifically, MDA requires (i) that data distributions are multivariate normal, and (ii) equal covariance structures

for the data groups under investigation.

Kolmogorov-Smirnov tests for non-normality were conducted via an SPSS routine. The tests were significant, which is in line with earlier studies that have reported the non-normality of accounting ratios, (Barnes, 1982). However, a number of researchers have argued that this problem might not be too damaging, provided that the departure from multivariate normality is not too severe, (Tabachnick and Fidell, 1983; Hair *et al.*, 1987; Flury and Riedwyl, 1988). Nevertheless, the problem in practice is to know the point at which non-normality becomes critical, and to date no statistical test is available to discern the critical value.

Multiple regression has much in common with MDA and is an obvious alternative because it does not place such exacting requirements on the data. However, the existence of a binary or dichotomous dependent variable, as is the case with bidders versus targets, means that the usual assumptions required of the error term are violated and the classical statistical tests are not available, (Pindyck and Rubinfeld, 1981). Fortunately, there is a special form of the general loglinear model, *logit modelling*, which avoids these problems and provides a suitable technique for the analysis of group membership represented by a dichotomous dependent variable. In the context of the present study the dependent variable (the logit) would represent the log odds, or relative probability of a firm in the sample being a bidder or a target. This is modelled by a binary response variable taking the value 1 if the firm is a bidder and zero if the firm is a target.

The general framework for the logit modelling technique is given by:

$$\ln\left(\frac{P_i}{1 - P_i}\right) = \alpha + \beta X$$

where P_i is the probability that a firm is a bidder, and $(1 - P_i)$ is the probability that firm is a target. X is a vector of predictor or independent variables. For a rigorous treatment of the derivation and statistical properties of logit modelling see, for example, Maddala (1983), Aldrich and Nelson (1984).

The essence of the logit modelling approach lies in its use of a cumulative probability function, which constrains the estimated values of the dependent variable (the logit) to lie within the (0,1) interval. There are a number of alternative cumulative probability functions available, but most use has been made of the logistic and normal distributions in the economics literature. These distributions respectively give rise to the logit and probit probability models.

Whilst statistical software for both the logit and probit models is readily available, a variant of the logit model, logistic regression, is preferred. This is because the sample of predictor (independent) variables are in continuous form and in these circumstances logistic regression is the preferred technique, (Demaris, 1992: 42). Logit or probit models are more appropriate when the predictors consist of categorical or ordinal variables.

Compared with least squares regression and discriminant analysis, logistic regression has a number of benefits, not the least of which is its less restrictive set of assumptions about the data. Furthermore, the technique also allows for meaningful interpretation of parameter estimates, which can be transformed by exponentiation into odds ratios, which have an obvious and intuitive appeal. Demaris (1992: 46) explains this in the following way:

Let b_j represent the sample estimate of B_j , the coefficient for the j th predictor. Then b_j estimates the change in the *log odds* of being in the category of interest [in the present study of being a bidder] for a one-unit increase in the j th predictor, controlling for all other predictors in the model. Moreover $\exp(b_j)$ is the estimated multiplicative change in the *odds* for a one-unit increase in the j th predictor, and $100(\exp(b_j) - 1)$ is the estimated percentage change in the *odds* for a one-unit increase in the j th predictor.

To date the logit modelling approach has only been applied in the M&A literature to the problem of target identification from the general population of firms, (Dietrich and Sorenson, 1984; Hasbrouk, 1985; Powell and Thomas, 1994). In the present study logistic regression is used for the similar task of discrimination between targets and bidders. The procedure LOGISTIC REGRESSION from the software package SPSS for Windows was employed to undertake the

statistical analysis.⁷

4.2 Variable Choice and Transformation for Logistic Regression

Examination of the correlation matrix for the various accounting variables exhibited high and statistically significant levels of correlation. With discriminant analysis collinearity among the dependent or predictor variables is non-problematic, but with logistic regression multicollinearity makes interpretation of the estimated coefficients unreliable. This makes variable choice particularly important.

As noted earlier, choosing among the various accounting measures of performance is difficult. Also, in order to obtain a clear picture of a firm's overall financial performance, it might be useful to include a number of accounting measures at various levels of aggregation. Use of a variety of measures also helps to address the problem of manipulation by an incumbent management team wishing to present the best picture to its shareholders. Manipulation for advantage at one level of aggregation is likely to have adverse implications at another. For example, it might be possible to boost the net profit margin, and thereby reported earnings per share in the short term, but the trading or operating profit margins might reveal deficiencies in performance that could have longer term consequences. Therefore, in order to capture the full picture with respect to performance it is useful to examine the accounting measures of profit at all levels. Unfortunately, the different measures are highly correlated and to include them all would be likely to confound any results obtained via logistic regression.

One way of dealing with the collinearity problem and also the problem of arbitrary choice between accounting measures is to transform a number of measures into composite variables. To be effective such a transformation has to produce a set of uncorrelated variables or *factors* that are capable of economically meaningful interpretation. Fortunately such a transformation is achievable via the statistical procedure Factor Analysis, which utilises the highly correlated property of the original variables to produce uncorrelated composite variables or factors. The

⁷ In addition, the procedure PROBIT from the same package was also used by way of a comparison. This procedure produces both logit and probit results, which in practice were very similar to those obtained with the LOGISTIC REGRESSION and are not, therefore, reported.

SPSS procedure FACTOR ANALYSIS was used to perform transformation of the industry standardized accounting data, and the results of the transformation are contained in Tables 5.4 and 5.5.

The Principal Components technique, combined with a Varimax Rotation, was used within the SPSS FACTOR procedure to extract an unrestricted set of factors from 16 accounting ratios. Only factors with eigen values greater than one are chosen, because factors with values below one do not contribute explanatory power beyond that provided by the variables in their original form. Using this criterion, Table 5.4 shows that just four factors accounted for 86.3 per cent of the total variance in the data set.⁸

Table 5.4

Percentage of Variance of Standardised Accounting Variables
Explained by Factors produced by Principal Components
Extraction. Sample Period 1980-90.

Factor	Eigenvalue	Pct of Var	Cum Pct
1	7.35228	46.0	46.0
2	3.51257	22.0	67.9
3	1.85696	11.6	79.5
4	1.08673	6.8	86.3

Table 5.5 presents a set of coefficients called *factor loadings* produced by the FACTOR procedure. These loadings indicate the weighting for each variable assigned to the four factors with eigen values greater than one. The Varimax rotation employed ensures that the estimated factors are orthogonal, and means that the factor loadings can also be interpreted as the correlation between the variable and the factors. The loading patterns in Table 5.5 suggest that the factors are capable of a ready and economically cogent interpretation. In the development of that interpretation,

⁸ Parsimony in the transformation of variables is clearly a virtue, particularly in Factor Analysis, provided that the factors obtained are capable of a meaningful economic interpretation.

factor loadings below 0.7 are ignored, (this is in line with normal practice, see Norusis, 1985: 145). A particularly pleasing feature of the factor matrix is the way that the loadings cluster in an unambiguous way about the variables associated with each factor.

The diagnostic test statistics also suggest that factor analysis is appropriate with this sample. The Bartlett diagnostic tests against a null hypothesis that the correlation matrix for the variable set is an identity matrix. The significance level suggests that the null can be rejected safely and that the factor analysis is a valid procedure. The Kaiser-Meyer-Olkin measure (KMO) is another test of the efficacy of factor analysis. It does this by recognising that the partial correlation coefficients between pairs of variables should be low after any linear effects of other variables have been accounted for and it consists of a comparison between the magnitudes of partial and observed correlations. Low values for KMO indicate that factor analysis would be unwise, but a value of 0.794 can be considered 'meritorious' (according to Norusis, 1988: B45) and confirms the factor analysis as a valid procedure.

Factor 1 (FROS - *factor* return on sales) is loaded most heavily with the five profit and cash flow ratios standardised by sales revenue. The loadings include both final year and 3-year average versions of these variables. None of the other variables have significant loadings for this factor and so it is clearly interpretable as a measure of operating activity and performance. Following Coates *et al.* (1996), FROS can also be interpreted as long term measure of performance.

The only significant loadings for Factor 2 (FROC - *factor* return on capital) comprise the variables RROE and RROC, with again both final year and 3-year average versions included. This factor is clearly interpreted as a performance measure relative to assets in place. In this case Coates *et al.* (1996) regard this as a shorter term measure.

For Factor 3 (FTAE) the loadings identify the two versions of the asset turnover variable, which is interpreted, as a measure of the effective use of assets. Finally, the loadings for Factor 4 (FGEAR) show its clear association with measures of financial gearing.

Table 5.5

Rotated Factor Matrix for Standardised Accounting Variables of Bidders and Targets. Sample Period 1980-90.

	Factor 1 (FROS)	Factor 2 (FROC)	Factor 3 (FTAE)	Factor 4 (FGEAR)
RROE(A)	.17505	.89848	.07823	.12816
RROE(1)	.10556	.86315	.01538	.10947
RROC(A)	.19067	.85700	.19971	-.06751
RROC(1)	.07551	.86865	.18687	-.09089
RTPM(A)	.94725	.01346	-.10410	.06630
RTPM(1)	.94435	.02195	-.09866	.06114
ROPM(A)	.94633	.02843	-.07321	.02853
ROPM(1)	.87263	.08189	-.09457	.03400
RNPM(A)	.88816	.26214	-.11862	-.07832
RNPM(1)	.87244	.27945	-.11748	-.08447
RCFM(A)	.87295	.13226	-.17564	-.03459
RCFM(1)	.89950	.14996	-.14373	-.02687
RTAE(A)	-.28579	.25713	.89216	-.04006
RTAE(1)	-.23047	.18500	.92808	-.03844
RGEAR(A)	-.00364	.00756	-.02773	.93905
RGEAR(1)	-.00497	.05854	-.03636	.93613

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.79400

Bartlett Test of Sphericity = 22563.220, Significance = 0.00000

Taken together, these four factors provide a reasonably comprehensive set of measures of financial performance. The factor analysis procedure has eliminated the problem of collinearity and so all four can be included in the logistic regression model, used to analyse the relative pre-bid performances of bidders and targets. In addition, four other variables were included in a step-wise process as proxies for other dimensions. The variables and the reasons for inclusion are dealt with next.

Previous UK studies (for example, Singh, 1971, 1975; Meeks, 1977; Levine and Aaronovitch, 1981) show firm size as *the* major discriminator between bidders and targets and so this is included, proxied by market values (MVAL). Next, some managerial theories, (Marris, 1964) suggest that growth and management motives for mergers are inextricably linked. Therefore, the

industry-adjusted price-earnings ratio (RPER) is included as a market-based proxy for growth opportunities. Another market-based measure the market-to-book ratio (MTB) is also included as a proxy for Tobin's Q which captures the relative prices of new assets versus assets-in-place. This measure has also been advocated as a measure of management performance, (PA Consulting Group, 1994). Finally, following the development of principal-agent theory in the context of free cash flow, (Jensen, 1986), the standardised dividend payout ratio (RPOR) is included as a proxy for the willingness of managers to disgorge surplus cash to shareholders.

Of these four additional variables, only RPER and MVAL added to the explanatory power of the accounting factors, and so the other two were dropped from the final logistic model. The lack of explanatory power might be accounted for by the fairly high correlations these two variables had with the retained variables.⁹ The final version of the logistic regression model thus consisted of the four accounting factors, the industry-adjusted P-E ratio, and firm size.

4.3 Logistic Regression Results, 1980-90

Logistic regression was used to test the disciplinary hypothesis, via discrimination between pre-bid performances of bidders and targets. If the MDH holds then targets are disciplined in the market for corporate control by bidders exhibiting superior performance. If this is so, then the estimated coefficients for all explanatory variables will take a positive sign and it will be possible to discriminate clearly between the two groups of firms. The results of this test are set out in Tables 5.6 and 5.7.

The results reported in Table 5.6 do not support the disciplinary hypothesis. Three variables FROS, FTAE, and RPER take the wrong sign, although only FTAE is statistically significant. (In logistic regression statistical significance is tested via the Wald statistic which is distributed χ^2 with large samples.¹⁰) The other three variables, FROC, FGEAR, and MVAL take the correct sign, but only the latter two are significant. Furthermore, only size makes a substantial

⁹ Interestingly both variables were also found to either add nothing or actually reduce discriminatory power when discriminant analysis at the exploratory stages of the research.

¹⁰ With a single degree of freedom, as is the case here, the Wald is simply the square of the ratio of the coefficient to its standard error, Norusis (1994: 5).

contribution to discriminatory power as measured by the R statistic, which measures the partial correlation between the dependent variable and each predictor, (Norusis, 1994: 5).

Table 5.6

Logistic Regression to Classify Targets and Bidders by Standardised Accounting Data Factors and Variables. Sample Period 1980-90

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.0078	0.0638	0.0150	0.9024	0.0000	0.9922
FROC	0.0971	0.0660	2.1605	0.1416	0.0102	1.1019
FTAE	-0.1232	0.0687	3.2122	0.0731	-0.0280	0.8841
FGEAR	0.1607	0.0728	4.8704	0.0273	0.0430	1.1743
RPER	-0.1692	0.1172	2.0825	0.1490	-0.0073	0.8443
RMVAL	0.8318	0.1091	58.1536	0.0000	0.1903	2.2974
Constant	-0.3030	0.1459	4.3149	0.0378		

McFadden's $R^2 = 0.1028$

Likelihood Ratio = 159.536 [6], p-value = 0.0000

The finding that bidders are substantially larger and more highly geared is consistent with a number of earlier UK studies, (Singh, 1975; Kuehn, 1975; Levine and Aaronovitch, 1981; Holl and Pickering, 1988; Cosh *et al.*, 1989). The failure to discriminate between bidders and targets is also broadly consistent with the earlier studies.

Despite the inconsistent results, the diagnostic statistics suggest that the model has some merit. The Likelihood Ratio is analogous to the F -test in multiple regression and tests the null hypothesis that the estimated coefficients for the independent variables for the model are zero. The ratio is distributed χ^2 with 6 degrees of freedom and is highly significant meaning that at least one of the coefficients is non-zero and that the model does have some explanatory power.

This interpretation receives some corroboration from the McFadden's R^2 statistic which is similar to, but not perfectly analogous to the adjusted coefficient of determination in multiple regression. It provides an assessment of predictive ability, ranging from 0, when the independent variables

are completely unrelated to the dependent variable, to a value of 1, when the model fits the data perfectly. It is defined as:

$$McFadden R^2 = \frac{(-2LL_0 - -2LL_1)}{-2LL_0}$$

where,

$-2LL_0$ = minus 2 times the log likelihood ratio for the model with only a constant term

$-2LL_1$ = minus 2 times the log likelihood ratio for the full model.

Although a value of 0.1028 is fairly modest, simulation studies have suggested that when compared with the OLS adjusted R^2 , McFadden's R^2 tended to underestimate the proportion of explained variance, (Demaris, 1992: 54).

While this logistic model has some explanatory value and was certainly an improvement over multiple discriminant analysis, (tried initially but not reported), it also has obvious weaknesses. These can be seen most obviously in relation its discriminatory power as demonstrated in Table 5.7.

Table 5.7

Classification Table for Targets and Bidders in Sample Period 1980-90 based on Logistic Regression in Table 5.6

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	502	57	89.80
Bidders	296	264	47.14
		Overall	68.45

One way of interpreting the classificatory power of the logistic regression is to compare the rate at which it correctly assigns cases, against the proportion of cases that would be correctly classified by random assignment. (With equal group sizes random assignment would result in

50 per cent of the sample correctly classified.) With 68.45 per cent of cases correctly classified the model clearly outperforms random assignment. But, in the absence of a specific statistical test, whether the classificatory power is acceptable is a matter of judgement. In the context of discriminant analysis, Hair *et al.* (1987: 91) suggest that the improvement over random assignment should be at least an additional 25 per cent of cases. By this criterion the model does not work particularly well, although the results are not out of line with earlier work reporting MDA results, (see for example Singh, 1971; Levine & Aaronovitch, 1981).

Another feature of the classification matrix in Table 5.7 is the extent of the asymmetry between the classification rates for bidders and targets; with the striking success for the target group offset almost completely by a poor rate for the bidders. This could mean one of two things: either there is little multivariate difference between the two groups, or, alternatively, there is a problem with the chosen function. Both possibilities were examined.

First a number of alternative specifications of both the FACTOR procedure and the logistic regression were tested, but none performed better than the current models.

Second, in determining whether there are real multivariate differences between the two groups, it must be remembered that logistic regression resolves group membership on the basis of estimated probabilities. This, as Norusis (1994: 8) points out, (albeit in the context of discriminant analysis), means that firms are grouped by comparing an estimated probability with a cut-off point of 0.5. From the classification table it is not possible tell whether firms grouped correctly had estimated probabilities only marginally above (below) the 0.5 level. Clearly there would be more confidence in the classificatory power of the model if the estimated probabilities for the correctly classified cases were a considerable distance above (below) the 0.5 cut-off point. To investigate this issue, the SPSS procedure was used to produce a histogram of groups frequencies against the estimated probabilities. As expected, the histogram revealed considerable overlap between the distributions of target and bidder groups, with considerable bunching around the 0.5 cut-off point. This confirms that there is indeed very little difference in the pre-bid performances of the two groups.

5. EVENT STUDY AND ACCOUNTING RESULTS COMPARED

In this section the results from the event studies reported in Tables 4.4 through 4.14 are compared with the results reported above in Tables 5.2 through 5.7. In addition, the financial characteristics of bidders with wealth gains are compared with those which recorded losses, using the factor analysis and logistic regression procedures outlined above.

5.1 Comparison of Share Price and Accounting Results 1980-90

Recall that the event study results demonstrated that targets make substantial gains around announcement (Tables 4.6 and 4.7), while bidders suffered statistically significant losses, (Table 4.9). When the event window was extended to include a period 60 days prior to announcement, bidders still suffer losses, but these are no longer statistically significant (Table 4.8)¹¹. However, even with this extended window well over 50 per cent of bidders suffered losses; a result that is significant according to the binomial test. With the market for corporate control judging that greater than 50 per cent of bidders are likely to result in wealth losses for shareholders, the strategic decision making of the corporate management teams would appear to be inconsistent with a disciplinary motivation in the market for corporate control.

The univariate results presented at the beginning of this chapter (Tables 5.2 and 5.3) are to some extent at odds with the event study results. They showed broadly that acquirers had superior performance in the year prior to bid announcement and that this was due for the most part to a decline in the performance of targets relative to industry norms. However, when performance was measured by the pre-bid 3-year averages, bidders no longer exhibit superiority relative to targets, and indeed, according to some measures, targets outperformed bidders. This inconsistent picture is confirmed by the multivariate results (Tables 5.6 and 5.7), which show that it is difficult to discriminate clearly between the pre-bid performances of acquirers and targets.

The wealth losses suffered by acquirers suggest that the market is sceptical of the benefits of

¹¹ In the previous chapter it was argued that even if losses were insignificant over an event window covering the 60-day pre-bid period, this could not be used explain away the significant losses that are recorded at the time of a bid announcement.

mergers and acquisitions. On the basis of the results reported above, this market view appears to be consistent with the performance record of acquirers relative to targets in the three year period prior to acquisition. Thus, there appears to be a certain consistency between the two sets of results.

5.2 The Financial Characteristics of Winners & Losers

Despite this an examination of the underlying *distribution* of share price returns shows that some acquirers make substantial gains. (For example, measuring abnormal performance over the announcement to completion interval, bidders in the fourth quartile show gains of over 10 per cent.) Clearly in some cases the collective wisdom of the market for corporate control judges that some mergers and acquisitions represent positive net present value investments. That being so, an obvious question to pose is whether acquirers with positive returns can be distinguished from those with negative share price returns?

To answer this question the sample of bidders was divided into two groups on the basis of the sign of abnormal returns recorded over the A-C interval. The factor analysis and logistic regression procedures used earlier in the chapter were then employed to test whether acquirers with positive wealth gains and those that suffered losses exhibited superior/inferior performances relative to the corresponding target groups. In fact the results for both groups were as inconclusive as those reported above and are not reported here. Even though neither group of acquirers obviously outperformed their respective targets, it might be that the market discerns certain features of acquirers that results in share price gains for some and losses for others. To test this possibility, the acquirers with wealth gains were compared with those that suffered losses and the results of this analysis are set out in Tables 5.8 and 5.9.

On the basis of this evidence, it would appear that it is not possible to discriminate between the pre-bid performance of acquiring firms that make share price gains and those that suffer losses. This is confirmed by the classification matrix for the regression (Table 5.9) which shows that the model had little ability to discriminate between winners and losers above random assignment.

Table 5.8

Logistic Regression to Classify Bidders by Standardised Accounting Data Factors and Variables. Sample Period 1980-90. Bidders divided into two groups by the value of $CAAR_{A-C}$ with the cut-off criterion set at zero.

Variable	β_i	$SE(\beta_i)$	Wald	p-value	R	$Exp(\beta_i)$
FROS	-0.1246	0.0924	1.8184	0.1775	0.0000	0.8828
FROC	-0.0293	0.0877	0.1117	0.7382	0.0000	0.9711
FTAE	-0.0605	0.0905	0.4467	0.5039	0.0000	0.9413
FGEAR	-0.1158	0.0891	0.6570	0.1980	0.0000	0.8907
RPER	0.0062	0.0252	0.0613	0.8045	0.0000	1.0062
RMVAL	-0.0998	0.1588	0.3951	0.5296	0.0000	0.9050
Constant	-0.1101	0.1760	0.3915	0.5315		

McFadden's $R^2 = 0.0104$

Likelihood Ratio = 4.786 [6], p-value = 0.5715

Table 5.9

Classification Table for Bidders in Sample Period 1980-90 based on Logistic Regression in Table 5.8

Observed	Predicted		Percent Correct
	Bidders (-)	Bidders (+)	
Bidders (-)	285	21	93.14
Bidders (+)	239	14	5.53
		Overall	53.49

Whilst the accounting and share price results reported up to this point present a reasonably consistent picture, the accounting data have not, as yet, offered any notable insights into the substance of the event study results. However, the possibility of intervening variables or influences have been ignored, influences that might well have an important impact on the power of the logistic discrimination model. In the next section one of the most important factors, the extent to which the lines of business of acquirer and acquired are related, is re-examined.

6. THE IMPACT OF RELATEDNESS

Following the discussion of the relatedness issue in Chapter 4, there are a number of reasons to think that related bidders are more likely to exhibit superior performance relative to targets than those engaged in unrelated transactions. First, a related bidder in direct competition with its intended target is only likely to have the financial resources to launch a bid, or to be in a position to raise those resources if it exhibits superior performance.¹² Second, a related bidder is likely to be in a better position to recognise underperformance and inefficiency. Third, a bidder is more likely to know about and to be able to value more accurately the operational or financial synergies that might be realised post-merger.¹³ Fourth, it is more rational for a management team to launch a bid from a position of relative strength in performance terms.

There are also reasons to think that related acquirers are more likely to experience wealth gains at announcement than those involved in diversification. Recall that modern portfolio theory suggests that diversification is achieved more effectively and efficiently in financial assets than in productive assets and so, *ceteris paribus*, diversification in the latter would not be valued by the market. The caveat is important, because if the market has a predisposition to favour related acquisitions, this is only likely to be so if the bidder exhibits superior performance relative to its target. This follows from the reasoning which suggests there is good reason to think that the market is in a better position to judge the relative performance of management teams when they are direct rivals, and that the market is more likely to reward efficient management than the less efficient.

To test the relatedness hypothesis the sample was divided into two groups. The first consisted of bidders and targets involved in related acquisitions, the second group included those involved in unrelated acquisitions. The factor analysis procedure was then run separately for the two groups to produce the factored variables. These factors were then used, together with the RPER

¹² Even though an unrelated bidder might be underperforming its industry or sector, it might, nevertheless, have better performance (ignoring risk) than its intended target and thus the necessary financial resources to launch a bid.

¹³ The hubris hypothesis notwithstanding, (Roll, 1986).

and MVAL variables, in logistic regressions in an attempt to discriminate between bidders and targets in related and unrelated transactions. The results are set out in Tables 5.10 through 5.13 below.

Table 5.10

Logistic Regression to Classify Industry-Related Bidders and Targets by Standardised Accounting Data Factors and Variables. Sample Period 1980-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.0938	0.0969	0.9364	0.3332	0.0000	1.0984
FROC	0.1943	0.1025	3.5966	0.0579	0.0496	1.2145
FTAE	0.1654	0.1190	1.9334	0.1644	0.0000	1.1799
FGEAR	-0.0047	0.0961	0.0024	0.9608	0.0000	0.9953
RPER	-0.0703	0.1791	0.1539	0.6948	0.0000	0.9321
MVAL	1.0759	0.1982	29.4635	0.0000	0.2057	2.9327
Constant	-0.5217	0.2306	5.1199	0.0237		

McFadden's $R^2 = 0.1293$

Likelihood Ratio = 83.858 [6], p-value = 0.0000

The results in Table 5.10 demonstrate that even when bidders and targets are in related lines of business there is little to discriminate between them in the pre-bid period. Whilst the profitability and asset utilisation factors all take the correct sign, only FROC and MVAL are statistically significant. The R statistic also shows that these are the only variables to make meaningful contributions to the discriminant function.

The diagnostic statistics suggest that the model has some explanatory power, but clearly insufficient to discriminate effectively between bidders and targets. This judgement is confirmed by the classification matrix in Table 5.11. The proportion of correctly classified firms is slightly better than for the whole sample, but at 70 per cent, still fails to reach the criterion of a 25 per cent improvement above random assignment outlined in section 4.3 above.

Table 5.11

Classification Table for Industry-Related Bidders and Targets in
Sample Period 1980-90 based on Logistic Regression in Table 5.10

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	207	27	88.46
Bidders	113	121	51.71
		Overall	70.09

The same procedure was adopted for the second group of unrelated bidders and targets. The factor analysis in this case only produced 3 factors with eigen values greater than one, even though over 80 per cent of the variance from the set of accounting variables was accounted for, in line with the factor analysis in all other cases.

Table 5.12

Logistic Regression to Classify Unrelated Bidders and Targets by Standardised Accounting Data Factors and Variables. Sample Period 1980-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.0103	0.0826	0.0157	0.9004	0.0000	0.9897
FROC	-0.0981	0.0844	1.3513	0.2451	0.0000	0.9065
FGEAR	0.2009	0.0972	4.2714	0.0388	0.0503	1.2225
RPER	-0.2908	0.1582	3.3793	0.0660	0.0392	0.7476
MVAL	0.7133	0.1305	29.8833	0.0000	0.1762	2.0406
Constant	0.1225	0.1920	0.4069	0.5236		

McFadden's $R^2 = 0.0881$

Likelihood Ratio = 79.217 [6], p-value = 0.0000

The logistic regression results in Table 5.12 show that targets in unrelated acquisitions had better pre-bid performance than the firms that acquired them. The two profitability factors FROS and FROC take the wrong sign, although neither are significant. The negative sign and statistical

significance of RPER suggest that targets had better growth prospects and that bidders might have been attempting to buy growth opportunities, a strategy unlikely to be valued by the market. Once again, unremarkably, firm size, MVAL, is the major discriminator.

The classification matrix in Table 5.13 suggests that the model has only weak discriminatory power.

Table 5.13

Classification Table for Unrelated Bidders and Targets in
Sample Period 1980-90 based on Logistic Regression in Table 5.12

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	284	40	87.65
Bidders	173	151	46.64
		Overall	67.13

Although inclusion of the relatedness dimension failed to improve discrimination between bidders and targets, it might be that related and unrelated bidders (as initiators of acquisition transactions) have different characteristics. This was also tested via the factor analysis and the logistic regression procedures. The results of this analysis are presented in Tables 5.14 and 5.15.

In this case all the variables take a positive sign, indicating that on average bidders in related acquisitions exhibit better pre-bid performance than unrelated bidders. Even so, only FROS and FTAE are statistically significant and make any real contribution to discrimination between the two groups of firms. The diagnostic statistics also show that the model does not perform as well as in the previous tests, and this is confirmed by the classification matrix in Table 5.15.

Table 5.14

Logistic Regression to Classify Related/Unrelated Bidders by Standardised Accounting Data Factors and Variables. Sample Period 1980-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.2332	0.1013	5.2987	0.0213	0.0659	1.2626
FROC	0.0544	0.0916	0.3522	0.5529	0.0000	1.0559
FGEAR	0.0215	0.0868	0.0614	0.8043	0.0000	1.0217
FTAE	0.4026	0.1342	9.0001	0.0027	0.0960	1.4957
RPER	0.1144	0.1597	0.5128	0.4739	0.0000	1.1212
RMVAL	0.0240	0.0257	0.8700	0.3510	0.0000	1.0243
Constant	0.4624	0.1852	6.2365	0.0125		

McFadden's $R^2 = 0.0262$

Model Improvement = 19.891 [6], p-value = 0.0029

Table 5.15

Classification Table for Related/Unrelated Bidders Sample Period 1980-90 based on Logistic Regression in Table 5.14

Observed	Predicted		Percent Correct
	Bidders (U)	Bidders (R)	
Bidders (U)	302	22	93.21
Bidders (R)	199	35	14.96
		Overall	60.39

Overall, these accounting results are broadly consistent with previous UK studies, (Sudarsanam *et al.*, 1996; Cosh *et al.*, 1980; Meeks, 1977), which have also found it difficult to distinguish between the pre-bid performances of acquired and acquiring firms involved in related and unrelated mergers.

7. SUMMARY & CONCLUDING REMARKS

At the beginning of the chapter it was argued that the share price event study has a number of limitations when testing the disciplinary hypothesis. In particular share price returns do not permit a direct test of the proposition that acquirers will exhibit superior performance relative to targets. While recognising that accounting data also has limitations, these are offset to some extent by the opportunity to conduct a direct test of the hypothesised superiority of bidders. Furthermore, it was argued that using accounting data and share price data in combination offered the potential of mutually reinforcing insights, that would not be available to either used independently.

The financial characteristics data for bidders and targets were subjected to three forms of statistical analysis. The first, an exploration of the data was undertaken via a series of univariate *t*-tests. This provided some evidence for superior bidder performance in the year immediately prior to takeover, but this disappeared when performance was examined over the three year pre-bid period. Despite the weaknesses of univariate tests, the one year results did suggest that a multivariate examination of the data would be worthwhile.

In the first instance that examination followed the earlier literature, (Hasbrouk, 1985; Levine and Aaronovitch, 1981), and utilised multivariate discriminant analysis (MDA). However, the results from MDA were poor and offered little improvement in the discrimination between bidders and targets beyond that expected with random assignment. It was suggested that one reason for the weakness of the MDA results was probably due to the data restrictions imposed by this technique: restrictions that are clearly not met in the case of accounting data, (Barnes, 1982). As a result of the weak performance of the MDA technique, the results were not reported.

Due to the binary characteristic of the dependent variable and continuous independent variables, logistic regression was chosen as a suitable alternative to MDA, (Demaris, 1992). In order to overcome the problem of collinearity with accounting ratios, the data was transformed into orthogonal factors, via the principal components version of the family of statistical procedures known as factor analysis. This procedure had the added benefit of avoiding an arbitrary choice

between alternative accounting measures of performance. The factor analysis worked well in terms of parsimony, producing four factors capable of ready and economically meaningful interpretation.

The logistic regression model used to discriminate between bidders and targets worked less well and offered little support for the disciplinary hypothesis. The results were generally weak and the model had poor classification power. Estimated regression coefficients often took an unexpected sign and were not statistically significant, and perverse signs for some of the performance measures. Despite testing a variety of different formulations of the logistic model, none were found to demonstrate bidder superiority relative to targets, as required by the management displacement hypothesis.

The accounting data were analysed further by utilising the share price returns results reported in Chapter 4. The bidders were divided into two groups; those that had positive or zero announcement returns in one, those that had negative returns in the other. The two groups were then subjected to the factor analysis and logistic regression procedures described above. The results from this exercise were also very poor, with the logistic model unable to discriminate between the two groups of bidders much beyond that obtained by random assignment.

Finally, the relatedness issue was re-examined using the same procedures. Once again the results obtained were weak and offered no support for the hypothesis that prior industry knowledge would provide related bidders with advantages that would be recognised in the market for corporate control.

Although these results are rather negative, they are consistent with those reported in Chapter 4, to the extent that neither set of results supports the disciplinary hypothesis. If the market for corporate control is indeed the site where rival management teams compete for control over assets, (Manne, 1965; Fama, 1980; DTI, 1989), then motives other than the exercise of discipline over poorly performing groups of managers seem likely to be at play.

However, in common with most previous research the current study has ignored one potentially

important feature of the data, namely the date of acquisition. A casual view of the aggregate data series on mergers and acquisitions shows that there is considerable variation over time. There is also a considerable body of evidence on aggregate M&A activity to suggest that this variation is due to systematic factors, (Golbe and White, 1988; Town, 1992; Crook, 1995, 1996). Furthermore, if acquisitions are simply regarded as an alternative form of investment, then it is known that investment decisions can be heavily influenced by a variety of cyclical factors that bear on the economic environment¹⁴. Therefore, it might be that at some times acquisitions are driven by expansionist (managerial or strategic) motivations, whilst at other times their disciplinary character is more evident and more in line with the theoretical arguments that have been advanced about the market for corporate control, (Manne, 1965; Fama, 1980; Jensen and Ruback, 1983). These ideas are examined in detail in the following two chapters.

¹⁴ See for example the surveys of investment intentions published periodically by the Confederation of British Industry.

CHAPTER 6

The Impact of Time on Shareholder Wealth

1. INTRODUCTION

The first phase of the empirical work presented in Chapters 4 and 5 represented a series of tests of the disciplinary hypothesis of mergers and acquisitions. The tests involved examinations of shareholder wealth effects for a sample of 559 takeovers during 1980-90, together with an investigation of the pre-bid financial characteristics and financial performances of bidders and targets over the same period. In addition, the influences of business relatedness on wealth effects and relative financial performance were examined. The results from this empirical work offered little support for the conventional characterisation of the market for corporate control as a disciplinary mechanism. On average, the shareholders of acquirers suffered statistically significant wealth declines and the accounting data demonstrated that, on average, acquirers failed to exhibit superior pre-bid performance relative to their targets. While net value measures suggested that takeovers might have enhanced shareholder wealth in aggregate, most of the gains achieved by target shareholders seem to have been at the direct expense of shareholders of acquiring firms.¹

The purpose of the next phase in the empirical work is to re-examine these issues in the light of influences due to the business cycle and the merger cycle. As pointed out at the conclusion of the previous chapter, earlier UK studies have largely ignored these influences, although occasional references have been made *en passant* to differences in wealth effects in different eras, (for

¹ These net value measures exclude transactions costs; if these were accounted for they would be likely to outweigh the small net gains achieved in many transactions.

example see Limmack, 1989; Sudarsanam *et al.*, 1996; Higson and Elliott, 1998).

It will be argued in detail below that the influences of general economic climate and level of activity in the takeover market are likely to have significant impacts on management motivation and strategic decision making. Given the neo-classical provenance of the dominant theoretical paradigm in the M&A literature, the management displacement hypothesis and its derivatives, the lack of *specific* attention paid to the influence of the general economic climate and the effluxion of time is, perhaps, not particularly surprising. The invariance principle is, of course, a cornerstone of expected utility theory which underpins modern finance theory, and in particular the neo-classical theory of investment decision making under risk and uncertainty. This invariance principle is challenged head-on in the current chapter and in what follows. This is done in two ways. First, by analysing the extent to which management motives are determined or influenced by economic conditions in general and the level of aggregate M&A activity in particular. And second, by utilising the economic-psychology literature, and in particular *prospect theory* from Kahneman & Tversky (1979), to examine the impact that changes in the risk environment might have on management strategies and decision making. In addition, by adopting an investment appraisal framework for mergers and acquisitions, the issue of wealth maximisation as *the sole* management maximand is re-examined via the appraisal model of Grinyer (1986).

These analytical contributions suggest clearly that the motives and strategies of bidders will be directly influenced by the economic climate and by conditions prevailing in the market for corporate control. Thus the date of acquisition can be seen as a potentially important determinant of whether the strategic intentions of bidders are likely to be consistent with the disciplinary hypothesis, or alternative managerialist motives. The economic consequences of these strategic alternatives are, obviously, likely to be very different.

The chapter is organised in a further seven sections. Section 2 reviews the empirical evidence on aggregate activity in the market for corporate control. This review covers research on the statistical modelling of time series M&A data and also research into the determinants of aggregate M&A activity. Section 3 examines the issues involved in strategic decision making

and management motivation, and in particular how changes in the economic climate and in aggregate takeover activity are likely to influence strategies and motivation. The assumed invariance of management objectives (wealth maximisation *versus* managerial objectives) are also questioned.

In section 4, the pattern of M&A activity and the economic conditions that prevailed during the sample period 1980-90 are explored and the period divided up into two sub-samples, 1980-85 and 1986-90. This section ends with an analysis of conditions in the market for corporate control and the likely impact of those conditions for management motive and strategies. The empirical impact on shareholder wealth in the two sub-samples are presented in sections 5 and 6, with the relatedness issue re-examined in section 7. The final section contains a brief summary and some concluding remarks.

2. AGGREGATE M&A - TIME SERIES EVIDENCE

The quasi-periodic or wave-like pattern of mergers and acquisitions activity in both the UK and US is well documented, (see for example, Benzie, 1990; Sudarsanam, 1995; Cooke, 1988; Shliefer and Vishny, 1991). A considerable literature has developed, mainly in the US, which has sought to explain these periodic ebbs and flows in aggregate M&A activity. The literature consists of two strands: one which attempts to model the phenomenon statistically and a second which aims to discover the economic determinants of the observed wave patterns. Neither issue is of specific concern here, but a brief review of that literature will provide a necessary and useful context for what follows.

2.1 Modelling M&A Activity over Time

The wave characterisation of UK and US M&A data is now generally accepted (Golbe and White, 1988, 1993; Town, 1992) as more than simply a stylised fact, (although there is at least one study that disputes this representation of the data, Shughart and Tollison, 1984). For example, using a model based on a sophisticated Markov switching-regime, Town (1992) characterises both the US and UK data series as having two states: 'a merger wave state and a *normal* merger activity state', implying that there is an *equilibrium* level of activity that is

disturbed from time to time. This 'disturbance' explanation couched in statistical terms finds a resonance with some of the early theoretical explanations of M&A activity, such as Gort (1969) and Aaronovitch and Sawyer (1975).

2.2 Determinants of M&A Activity over Time

Most studies of the determinants of M&A wave patterns have been based on US data and, in contrast to the data modelling exercises, the results have been rather less clear cut. The most successful and long-standing finding has been that share price indices and M&A activity are positively related, (Weston, 1961; Benzing, 1991; Melicher *et al.*, 1983). A number of explanations for this finding have been suggested. First, a rising stock market is associated with an increase in the demand for shares, making it easier for acquirers to raise the necessary finance, whilst at the same time reducing their cost of capital. Second, a rising market is a leading indicator of expansion in economic activity and presents potential acquirers with an opportunity to take advantage of improved economic conditions and the concomitant need to expand capacity. Third, and of particular relevance to the management displacement hypothesis, if bidding firms have better performance than targets, then this is likely to be accentuated during periods when share prices are rising, making the target relatively less expensive, (Sharma and Mathur, 1989).

In addition to stock market activity, other variables have also been shown to be related to M&A activity, including bond yields, measures of industrial production, GDP growth, measures of capacity utilisation or unemployment, and Tobin's Q .² However, unlike the evidence for the relationship between share prices and M&A activity, the evidence on these other influences is rather inconsistent, (Crook, 1996).

In the only systematic study of UK times series data, Crook (1995) uses a NPV capital budgeting framework together with co-integration econometric technology to investigate the determinants of aggregate M&A activity, over the period 1969-89. With the level of M&A activity as the

² Tobin's Q is defined as the ratio of market value to replacement cost of assets. However, the denominator is usually proxied by some measure of the book value of assets in place, due to the lack of available data on the replacement costs of assets.

dependent variable, Crook finds a positive long-run role for GDP growth and the *Financial Times All Share Index*, but negative impacts for Tobin's Q and the rate of unemployment (his proxy for capacity utilisation).

Interpreting these results, Crook explicitly rejects the Gort disturbance theory, but avers that the co-integrating vector of explanatory variables is consistent with an *ad hoc* explanation of M&A activity based on the characteristics of a long-term NPV model of investment. However, this model leaves large residuals from the fitted relationship, so Crook used a dynamic, short-run error correction model to explain the residual variance. In this model changes in M&A activity are positively associated with changes in the lagged versions of the growth rate, the share index, unemployment, and Tobin's Q. Interestingly, in the error correction model the proxy for Tobin's Q now takes on a positive sign.³ According to Crook (1995:76) this short-run dynamic model '... fits the data reasonably well', but he concedes that other factors are also required to explain the observed data series.⁴

What is clear from research at the aggregate level is that M&A activity varies on a systematic basis with changes in, or expectations of changes in the general economic climate. Although changes in macroeconomic factors appear to have a deterministic impact, there also appears to be a role for contingent agency effects to determine the level of M&A activity at any given time. The role of agency is examined next.

3. MANAGEMENT EXPECTATIONS, MOTIVES & INTENTIONS

3.1 The Influence of Economic Climate on Expectations

The investment appraisal framework adopted by Crook (1995) is a useful framework within

³ This finding of a change in sign for the Q measure between the long-run and short-run models might go some way to explaining the lack of consistency about the role of Q in a number of cross-section studies, although arguments have been advanced to suggest that it is perfectly possible for it to take either sign (see for example, Polonchek and Sushka, 1987). Positively, because a low value of Q reduces the price of acquisition relative to the purchase of new assets; negatively, because a low value of Q might, *ceteris paribus*, indicate an increased cost of capital.

⁴ Although Crook (1995) does not present his results in this way, it could be argued that they are consistent with the equilibrium-disequilibrium phases described by Town (1992).

which to consider management decision making with respect to mergers and acquisitions. Implicit within that framework is the role and influence of management expectations and motives, in particular those held by the management teams of acquiring firms. From regular survey evidence it is known that changes in expectations (driven by changes in the general economic climate and policy environment) have a direct impact on corporate investment *intentions*, (Confederation of British Industry, 1996). In addition, there is empirical evidence to show that investment decisions and the appraisal techniques used to make them can also be greatly influenced by the economic climate, (Pike, 1996). If mergers and acquisitions are considered in the context of investment decisions in general, then it follows that changes in the *expectations* held by potential bidders are likely to have a major impact on M&A intentions, and thus on the fluctuations in the observed M&A data series.

3.2 The Motives and Objectives of Acquiring Management Teams

As an extension of this line in reasoning, it is at least plausible to hypothesize that *management motives and strategies* which underpin investment intentions are also likely to be influenced by changes in expectations brought about by variations in the economic and regulatory environment. In other words, management motives for undertaking acquisitions might well be influenced by changes in the economic climate and, therefore, be expected to change over time.

There is recent UK evidence to suggest that in periods of low growth and increased competition in product markets, management strategies tend to be low risk and cautious in nature, with an emphasis on cost containment, (Geroski and Gregg, 1997). If that is so, then again it seems plausible to suggest that in these periods acquisitions are more likely to be driven by disciplinary motives. In contrast, during periods of high growth management strategies are more likely to be more aggressive and expansionist, with more opportunities for managerialist objectives to prevail. In terms of acquisitions, these managerialist tendencies might imbue the managers of bidding firms with an increased willingness to engage in potentially more risky and uncertain combinations in periods of economic expansion.⁵

⁵ For example, in such periods managements of bidding firms are much more likely to be infected by *hubris* as suggested by Roll (1986). Whilst he puts forward his hubris hypothesis as a plausible and potentially insightful contribution, Roll also points out that this is unlikely to be capable of explaining all merger failures. Roll does not

These hypothesized variations in the strategic behaviour of corporate management teams represent the nub of the issue. Changes in the economic climate in general and specifically in the market for corporate control are likely to influence management perceptions of risk and uncertainty with respect to mergers and acquisitions. This requires a more detailed examination of decision making under risk and uncertainty which follows.

3.3 The Influence of Risk & Uncertainty on Motives and Strategies

While expected utility theory, a vital constituent of modern finance theory, is built on the principle of invariance,⁶ alternative theories of choice under risk and uncertainty do not require decision makers to follow this axiom. For example, prospect theory advanced by Kahneman and Tversky (1979) suggests that the usual assumptions about the risk-averse decision maker, which form the crucial underpinning of expected utility theory, are very unlikely to hold in practice.⁷ Furthermore, there is now a considerable body of empirical research which supports the view that expected utility theory is a poor representation of decision making in practice, (see, for example, Grether, 1980; Tversky and Kahneman, 1981, 1983; Slovic and Lichtenstein, 1983). Tversky and Kahneman (1986:S256) summarise this evidence thus: '... variations in the framing of decision problems produce *systematic* [emphasis added] violations of invariance and dominance that cannot be defended'.

Despite such empirical evidence, defenders of the orthodoxy have argued that, given proper incentive structures, decision makers can apply heuristics to approximate rationality. And further, that competitive markets are likely to penalise those who take irrational economic decisions and reward those who do not, (for example Smith, 1985; Knez *et al.*, 1985). Tversky and Kahneman (1986) concede that this could be so, but add:

consider the issue of calendar time and the influence of economic cycles, but these clearly might play a part in the hubris "on/off" switch.

⁶ The invariance principle, along with cancellability, transitivity, and dominance, is a crucial assumption of rational decision making according to expected utility theory. The invariance principle holds that '... different representations of the same choice problem should yield the same preference', Tversky and Kahneman (1986:S253).

⁷ The violation of the invariance principle or assumption clearly undermines the usual positivist defence about decision makers making their decisions *as if they were holding to the tenets of the (neoclassical) theory being advanced*, (for example, Friedman, 1953).

'... experienced decision makers often do better than novices, and the forces of arbitrage and competition can nullify some effects of error and illusion. Whether these factors ensure rational choices in any particular situation is an empirical issue, to be settled by observation, not by supposition'. (p. S273)

To date, the evidence on this 'empirical issue' is, according to an extensive body of empirical evidence, not very supportive of the power of arbitrage and competitive markets to impose rationality. This appears so, even when opportunities to learn from past errors are available on a consistent basis, (for example, Hausch *et al.*, 1981; Halmi and Waldman, 1985; Russell and Thaler, 1985; Akerlof and Yellen, 1985).

Kahneman and Tversky (1979) and Tversky and Kahneman (1986) make no claims for the ability of prospect theory to evince normative principles of decision making. However, they do claim that it represents a better description of how decisions are actually made than does expected utility theory.

According to prospect theory, decision makers view outcomes with respect to a reference point (often taken to be the status quo) and their preferences vary depending on where the risky prospect lies with respect to that point. In other words, whether the decision maker adopts a risk-averse, risk neutral, or risk-seeking stance depends on the relation of the prospect to the reference point. In particular, when an outcome that could lead to substantial risk is viewed from a favourable point of departure relative to the reference point or benchmark, the decision maker (executive) is likely to be (paradoxically perhaps) risk averse. When, on the other hand, an outcome is viewed from a position of weakness relative to the reference point or benchmark, an executive might well exhibit a risk seeking preference. This description of risk assessment in decision making has received considerable support beyond Kahneman and Tversky, (for example, Schoemaker and Kunreuther, 1979; Fishburn and Kochenberger, 1979; Budescu and Weissfound, 1987; Feigenbaum and Thomas, 1988; Kameda and Davis, 1990).

The analysis above suggests clearly that variations in framing the decision problem can give rise to violation of the invariance principle, leading to systematic shifts in risk preferences over time. If the framing of decision problems is a function of the economic climate then it follows that risk

preferences might vary with changes in economic conditions. This is consistent with the evidence from Pike (1996), that managers vary the weighting of investment appraisal techniques employed, depending on the economic circumstance that they face. In addition, there is the real possibility that the reference point also shifts in response to changes in economic conditions.

Therefore, applying the literature on decision making under risk and uncertainty in general, to decision making in the mergers and acquisitions domain, offers a rationale for the assertion above that different managerial motives are likely to have operated over the 11 years, 1980-90, (when dramatic changes in the economic climate were witnessed).

The decision about a risky prospect (an acquisition) is framed by a complex reference point that includes the general economic climate, but also the bidder's performance relative to an industry or sector benchmark, and the target's performance in particular.

While the reference point would obviously include the macroeconomic climate, which might be expected to condition the degree of risk aversion in general, (Geroski and Gregg, 1997), it is likely to be viewed by corporate management teams as beyond their control. But the reference point for decisions at the level of the individual firm is much more complex and includes the microeconomic climate over which management teams will think that they have some influence. In particular, how a potential bidder is performing relative to its industry and a potential target can be expected to play a major part in the assessment of risk. It is here that the insights from prospect theory offer some leverage on the acquisition decision.

In an unfavourable macroeconomic climate there will be a tendency for firms to postpone risky investments, (Geroski and Gregg, 1997; CBI, 1996); this might account for a reduction in aggregate levels of M&A activity. In such a climate potential acquirers that are performing well relative to their industry or competitive universe are likely to be risk averse, eschewing expansionary or growth oriented mergers. The general economic climate would be likely to reinforce this tendency of good performers to be risk averse. Therefore acquisitions undertaken by good performers in poor economic conditions are more likely to be driven by strategies that focus on the potential for cost savings and economies, acquisitions that might be defined as

'disciplinary' in nature.

In an expansionary macroeconomic climate the reverse might be expected to be the case. Corporate management teams in general will be less risk averse and more willing to bring forward growth oriented projects. Thus M&A activity along with other forms of investment rises. Firms performing well in relation to the peer group continue to exhibit more risk aversion than those who are not performing as well. According to prospect theory the latter are already inclined to be risk seekers and the general economic climate and higher levels of aggregate M&A activity would be likely, therefore, to reinforce these risk preferences. Thus more acquisitions are likely to be driven by expansionary strategies (managerialist motives) when the economy is performing well and M&A activity is high.

A similar line of reasoning can be applied to the issue of relatedness. In an expansionary macroeconomic climate related acquisitions would be more likely to be driven by strategies associated with corporate expansion than with disciplinary, cost saving strategies. In a poor macroeconomic climate the reverse would hold. Related targets would be more likely to be acquired for reasons of cost savings, than for strategies based on expansion of markets or market share.

If these arguments hold, then one might expect to observe good performers driven by disciplinary strategies to dominate acquisition activity in adverse economic conditions. *A fortiori* related acquisitions in such a climate would be more likely to yield synergistic gains to acquirers, than in expansionary economic conditions when the focus is more likely to be on capturing market share and growth oriented strategic behaviour. In contrast, in a bouyant macroeconomic climate one might expect, in line with a general reduction in risk aversion, to observe M&A activity dominated by firms with inferior performance records. Given that related acquisitions are now more likely to be driven by growth strategies it might be expected that they would be less profitable than in recessionary conditions.

In summary, the preceeding analysis supports the hypothesis that risk averse (disciplinary) strategies employed by acquirers with good track records would be to the fore during economic

downturns, with risk seeking (managerial) strategies more the norm during periods of economic expansion. If this is so, then it might be expected that the success and failure of acquisitions, as measured, for example, by shareholder wealth effects, will simply reflect these variations in management motivation, strategic behaviour and propensities of acquiring management teams to take on risky combinations.

3.4 Maximisation of Shareholders' Wealth - a Re-examination

Of course, the preceding analysis suggests abandoning the conventional characterisation of decision making under risk and uncertainty. However, considering risk and rationality from a different perspective, and without abandoning the conventional axioms of expected utility theory, Grinyer (1986) suggests ways in which it could be considered irrational for corporate managers to attempt to maximise shareholders' wealth when making investment decisions.

Grinyer's model proposes a view of management motives based on different perceptions of risk held by shareholders and managers. Portfolio theory and the capital asset pricing model provide the normative rule that managers should only consider the systematic risk of an investment project (acquisition). This is due, of course, to shareholders' abilities to diversify unsystematic risk. However, in contrast to shareholders, Grinyer argues that managers are much more likely to be concerned with total risk, and that the difference between total risk and systematic risk is likely to be non-trivial.⁸ It is total risk that determines the business as a going concern and the ability to maintain a going concern has a crucial impact on a manager's standing in the managerial labour market.

In addition, and unlike shareholders, corporate management teams have to consider the claims of other stakeholders in the business, including customers, suppliers and labour. Thus, adopting a principal-agent approach and the 'nexus of contracts' formulation from Fama (1980), Grinyer argues that management teams are unlikely to privilege shareholders' interests to the exclusion of other claimants. Rather than maximising shareholders' wealth, he argues that it would be more rational for managers to maximise what he defines as monetary surplus, a less exacting

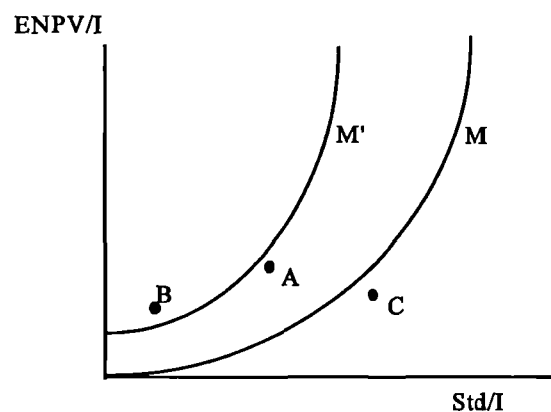
⁸ Grinyer uses the risk measures on over 2000 UK firms from the LBS Risk Measurement Service to demonstrate this, (see footnotes 10 and 11, p.321).

requirement to the extent that it allows for total risk.

On the assumption that shareholders might be aware of the asymmetry in risk perceptions, Grinyer examines ways in which corporate management teams could be forced to maximise shareholders' wealth. These include the competitive forces operating in product markets and moral suasion, both of which he rejects as inoperable. A third force could be the threat of dismissal if shareholders are able to discern non-maximising behaviour, but the asymmetry of information in favour of managers will convince them that they will be safe from the degradations of shareholders provided that they produce a 'satisfactory' return.

For present purposes the crucial feature of Grinyer's model lies in the fact that managers are concerned with total risk not just systematic risk. The following diagram explains his model.

FIGURE 1: Grinyer's Model of Risk Assessment in Capital Budgeting



The return, $ENPV/I$, is the expected net present value using a CAPM-derived discount rate, standardised by the capital investment. Risk is measured on the horizontal axis by Std/I , which is the standard deviation of ENPV, also standardised by capital investment.

From the shareholders' perspective the horizontal axis represents the acceptance criterion, given that the ENPV is calculated by discounting the project cash flows by a rate that represents systematic risk. The manager's risk-return trade-off, reflecting the concern with total risk is represented by M . Both investment projects A and B lie above this acceptance criterion, but

project C below it and so the latter will not be accepted, even though it would be in the shareholders' interests to do so. At this point Grinyer's analysis ceases.

Extending Grinyer's analysis, assume now a worsening of the economic conditions faced by the firm, which could be general or firm-specific. The worsening climate increases total risk (whilst, of course systematic risk, measured by the CAPM beta is unaffected) causing a shift in the risk-return trade-off to M'. Given the management concern with total risk now project A is also rejected. Improvements in economic conditions would then see a downward shift in the trade-off.

The extension of Grinyer's model to include shifts in the risk-return criterion is a useful way of conveying or characterising how shifts in risk preferences during 1980-90 might have affected decisions about acquisitions. This characterisation of decision making processes over time suggests that more cautious (disciplinary) motives will be likely to dominate during an economic downturn, with less risk-averse and expansionist (managerial) motives likely during an upturn.

3.5 Evidence for Changes in Management Merger Motives

An examination of the US wealth effects research provides clear evidence that over time the consequences of mergers and acquisitions for the shareholders of acquiring firms has varied substantially, (Jarrell and Poulsen (1987); Bradley *et al.*, 1988; Jarrell *et al.*, 1988; Morck *et al.*, 1990; Agrawal *et al.*, 1992). One recent interpretation of the US evidence (Shliefer and Vishny, 1991:59) suggests that variations in returns to acquiring shareholders are the direct result of changes in management strategies and motivations over time:

'The most plausible interpretation of the evidence is that the takeover wave of the '80s served largely to reverse unrelated diversification of the '60s. Over a 30-year period, corporate America took a detour. This experience has several implications for economic analysis as well as for policy. ... [and] suggests that the world does not always move towards greater efficiency. It shows that takeovers can be as much a manifestation of agency problems as a route to correcting them. It also demonstrates that using the stock market as a gauge of profitability of corporate actions can lead one seriously astray; investors can and do make systematic mistakes.'

The suggestion that takeovers can be a manifestation of agency problems also has a clear resonance with the evidence advanced by Jensen (1986) in support of his theory of free cash

flow.

While there has not been a specific examination of variation UK wealth effects over time, three recent studies suggest some similarities with the US evidence, (Limmack, 1990; Sudarsanam *et al.*, 1996; Higson and Elliott, 1998). Taking these observations as the point of departure, a major aim of the present study is to subject the time-varying nature of returns to acquirers to *systematic* investigation. In doing so, it examines the force of the disciplinary (management displacement) hypothesis over time, by examining whether the characteristics of the acquisitions in the sample are consistent with discipline as the primary motive of bidding management teams.

3.6 Summary

The purpose of this section has been to question the assumption implicit in earlier studies that management strategies and decision making processes with respect to acquisitions are invariant over time. If an acquisition is regarded as another form of investment, then there is sufficient evidence available to show that investment intentions are directly influenced by changes in the economic climate. In turn, it was argued that motives for acquisitions would be similarly affected by the prevailing and expected economic conditions, as would management attitudes to the risk and uncertainty characteristics of an acquisition. Indeed, on the basis of asymmetrical perceptions of risk between shareholders and managers, the maximand of wealth maximisation as the sole motive of managers could be called into question, the more so as economic conditions vary. All this was taken to suggest that disciplinary strategies or motives were more likely to predominate in periods of economic decline than in expansionary periods. Finally, evidence was presented about changing management motives and strategies with respect to mergers and acquisitions, which points clearly to changes in motive and strategy over time.

In the next section these ideas are carried forward and provide the context for an analysis of the conditions that prevailed in general economic conditions and in the UK market for corporate control during the the sample period 1980-90.

4. THE PATTERN OF M&A ACTIVITY 1980-90

The aggregate data presented in Table 6.1 demonstrates that during the period from 1980 to 1990 there were two distinct phases of M&A activity. In the first half, 1980-85, the level of activity was at a relatively low level when compared to the second half, 1986-90, (and the previous 1972-73 peak). Even though there is a substantial decline in both numbers and value in 1990, the number is still some 64 per cent higher than in 1985, and acquisitions are still substantial when compared to gross fixed capital formation.

Table 6.1
UK Mergers and Acquisitions 1980-90

Year	Aggregate Number	Sample Number	Nominal Value £m	1990 Prices Value £m	% of GFCF ^a
1980	469	11	1475	2701	8.2
1981	452	13	1144	1903	15.3
1982	463	10	2206	3429	18.5
1983	447	24	2343	3448	18.0
1984	568	43	5474	7647	24.3
1985	474	64	7090	9392	23.8
1986	842	98	15370	19863	50.7
1987	1528	91	16539	20356	44.8
1988	1499	72	22839	26505	49.1
1989	1337	107	27250	29377	50.6
1990	779	26	8328	8328	42.8

^a Gross Fixed Capital Formation

Sources: Sudarsanam (1995) and Hughes (1993)

In terms of the macroeconomic climate during 1980-90, it is also possible to draw a broad distinction between the periods before and after 1985, confirmed by recent evidence on UK business cycles, (Blackburn and Ravn, 1992; Kontolemis, 1997). Although the recession in the early 1980s ended in 1981, (when GDP growth was -2.17%), economic activity did not recover to trend levels until 1983. The next (but low) peak occurred in early 1984, but was immediately

reversed by a minor recession which lasted to the end of the same year, (Kontolemis, 1997).

Thus the period 1980-85, which was associated with low levels of M&A activity, is also a period that is clearly dominated by the 1979-81 recession and its aftermath. This is confirmed by Geroski and Gregg (1997), who estimated that at the bottom of the trough in 1981, UK industrial and commercial firms had a mean operating profit margin of only 9.3 per cent. This contrasts with the later period when UK corporate profits achieved sustained and virtually uninterrupted growth. At the height of M&A activity in 1988, Geroski and Gregg (1997) estimate the mean UK operating profit margin at 13.4 per cent.

The present data sample presents, therefore, an opportunity to investigate the impact that the aggregate level of M&A activity and economic conditions had on shareholder wealth effects. It also presents an opportunity to investigate whether the relative performance characteristics of bidders and targets are influenced by aggregate M&A activity and the economic climate in general. In particular, to test whether the data are consistent with the prevalence of disciplinary strategies during the 1980-85 period and with what might be termed 'managerial' strategies during 1986-90.

Given this background and context, the impact of the economic climate and activity in the market for corporate control on the strategies of corporate managements is analysed further.

4.1 The Economic Climate and M&A Activity

In the early 1980s the UK suffered a well-documented recession of considerable severity, (Blackburn and Ravn, 1992; Geroski and Gregg, 1997; Kontolemis, 1997). As a consequence many firms faced a serious loss of earnings, financial difficulties, restructuring, and in many cases, ultimate demise and liquidation. Despite the poor economic climate for the corporate economy, the stock market was fairly buoyant, due perhaps, *inter alia*, to the shift in the balance of forces between capital and labour brought about by the Conservative administration's labour market reforms and the prospect of improved company profitability, (Menezes-Filho, 1997;

Brown and Wadhani, 1990). Furthermore, many orthodox economic commentators⁹ argued that the severe recessionary conditions would induce a necessary shake-out of uncompetitive firms, and that in the longer term the survivors, and thus the economy as a whole, would benefit.¹⁰ Whilst stock market sentiments were largely positive in expectation of an economic recovery, management teams in the industrial and commercial sectors, battling against significant economic difficulties, were likely to have been rather less sanguine, (Geroski and Gregg, 1997). Not surprisingly, in the recessionary and post-recessionary economic climate of the early 1980s, corporate sector investment and confidence¹¹ was at a relatively low level, as was the incidence of takeover activity.

In contrast, the second half of the decade saw economic recovery on a substantial scale. However, unlike earlier recoveries and booms and due to continuing legal reforms of the UK labour market, the balance of power between capital and labour did not swing back in favour of the latter, (Menezes-Filho, 1997; Brown and Wadhani, 1990). One consequence was a substantial rise in corporate profitability, and it would be reasonable to conjecture that the sentiments of UK corporate management teams were much more optimistic¹². This conjecture is certainly consistent with the observed increases in capital investment, a rising stock market, and increased activity in the market for corporate control. Against this background, the managerial motivations and decision-making with respect to acquisitions over the 1980-90 period are considered further below.

4.2 Conditions in the Market for Corporate Control 1980-90

Although the UK recessionary conditions of the early 1980s damaged many firms, (some fatally),

⁹ A good example of this type of commentary can be found in the editorials and articles of *The Economist* newspaper at the time.

¹⁰ See Geroski and Gregg (1997) for a review of the evidence and arguments about the alleged benefits of a 'shake-out' following recession.

¹¹ As evidenced by the Confederation of British Industry's *Quarterly Industrial Trends Survey* which at that time gives stylised representation of the sentiments of senior executives' with respect to their overall investment intentions.

¹² Certainly confirmed by the CBI's *Quarterly Industrial Trends Survey*.

they also presented favourable takeover opportunities for others. Geroski and Gregg (1997) show that the variance of firm performances widens considerably during economic downturns, and that this propensity to recession-induced differentials was particularly large during the 1979-81 slump. In such circumstances, despite and perhaps, indeed, because of the low level of activity in the market for corporate control, the early part of the 80s might well have been an opportune time for acquisition. For example, competitive weakness or financial distress in a potential target presents a bidder with considerable advantages. First, the incumbent management team might be less capable of resisting a bid and also be less inclined to do so.¹³ Second, shareholders of financially distressed or uncompetitive targets might be much more willing to accept a lower premium to the current market value than they might otherwise have done in more favourable economic circumstances.¹⁴ Third, any restructuring of the target's assets is less likely to be met with resistance from the target's workforce, particularly in the light of increasingly fragmented labour market conditions, (Brown and Walsh, 1991), thus improving the chances of successful post-acquisition integration.

Taken together, these considerations suggest that bidders would have probably expected to pay a much lower premium to acquire control in the first half of the 1980s, when M&A activity and economic growth was low, than in the second half of the decade, when both M&A and overall economic activity was buoyant. It is also plausible to hypothesize that management expectations about likelihood of bid success would have been greater in the first period, together with a lower likelihood of encountering a rival bidder. Yet another potential benefit to bidders during a slump in takeover market activity arises from the concomitant reduction in demand for the services of specialist M&A advisers leading to a reduction in fees.¹⁵

¹³ Holl and Kyriazis (1997) provide clear evidence that bid resistance is likely to reduce the probability of bid success and to increase the price of success.

¹⁴ The average premium in the 1980-85 sub-sample is 15.3 per cent and 24.8 per cent for the 1986-90 sub-sample.

¹⁵ As Brearley and Myers (1991: 849) point out '... merger activity is also very costly.' Citing UK survey evidence, Sudarsanam (1995:117) reports that merchant banks, which were typically appointed in 80 per cent of deals exceeding £20 million, receive between 1 and 1.5 per cent of the value of the M&A transaction. In addition lawyers and accountants would command substantial fees. He also reported dissatisfaction on the part of corporate managers with the preoccupations of merchant banks about closing the deal, given that the bankers' fees tend to be contingent on a successful completion.

Lower premiums, lower transaction costs, and greater likelihood of bid success; taken together these factors clearly suggest that conditions were likely to have been more favourable for acquirers in the first half of the decade than in the second. If this is so, then it should follow that these better prospects would have been recognised by the market for corporate control and reflected in better returns to acquiring shareholders. In other words, a plausible hypothesis is that acquirers would have been more likely to have achieved higher abnormal returns in the first half of the decade than in the second, an hypothesis that allows for a direct test with share price data.

4.3 Conditions in the Takeover Market and Management Motivations

Given the very different economic conditions in the two halves of the 1980-90 period, together with the differing balance of forces in the market for corporate control, it seems likely that the character of M&A activity might also have been different in the two halves of the decade. It seems, therefore, entirely plausible to suggest that management expectations, motivations, and intentions would also have been influenced by these objective factors. During the recessionary and post-recessionary conditions of 1980-85 management concerns would have centred in particular on the need to contain costs. (Geroski and Gregg, 1997 provide direct evidence for a preoccupation with cost containment in this period). Given these pre-occupations, it also seems plausible to suggest that decisions about acquisitions would have been more likely driven by disciplinary motives in this period.

In contrast, the vigorous economic expansion of the second half of the decade suggests a climate in which management teams would have been more concerned with enlarging market share, market positioning, and strategic goals. In this context the conclusion of EU negotiations to establish the Single Market, enacted into UK legislation in 1986, would have been likely to reinforce the expansionary and positioning motives of UK bidders, both in other countries of the EU and also within the UK, (Jansson *et al.*, 1994; Calori and Lubatkin, 1994). Indeed there is some survey evidence to suggest that the introduction of the Single Market measures in 1992 was having an important 'psychological' impact on management merger intentions, (Confederation of British Industry, 1989). Whilst in principle none of these objectives are necessarily against shareholder interests, there are reasons to think that they are more readily associated with managerial objectives than shareholder wealth maximisation, (Marris, 1964; Baumol, 1967;

Mueller, 1980; Jensen, 1986; Rentoul, 1988; Trautwein, 1990). A recent survey of chief executives from 146 of the top 500 UK firms, involved in merger during 1984-88, shows explicitly that shareholder interests, measured as impact on share price, was relegated to last place in a list of 8 measures by which acquisition success could be judged, (Ingham *et al.* 1992). Furthermore, with the improved cash flow position of UK firms during 1986-90, misuse of *free cash flow* on fashionable but unwise acquisitions is a distinct possibility, (Jensen, 1986). Summarising their findings about changing management priorities in different economic conditions, Geroski and Gregg suggest the following:

'... it may be that competitive pressures in most [product] markets are sufficiently weak during cyclical upturns to diminish the incentives that managers have to control costs'.
(1997:146)

Therefore, for all these reasons, it would appear that non-disciplinary objectives would have been more likely to have dominated M&A activity in the 1986-90 period.

If this analysis of the economic and conditions in the market for corporate control is accurate, and the hypotheses about management motives are correct, then it should be possible to find distinct differences in the returns to bidders in the two periods. Furthermore, if M&A activity in the two periods was driven by different objectives (disciplinary *versus* managerial) then this should be discernible in the financial characteristics and pre-bid performances of the firms involved. These issues are investigated in detail below.

5. SHAREHOLDER WEALTH EFFECTS

In this section share price returns to acquirers are examined via the event study technology described in Chapter 4. This is done for the two sub-periods identified above: namely 1980-85 and 1986-90. The disciplinary hypothesis remains the main focus, and is tested on the basis that acquirers engaged in disciplinary acquisitions will, on average, at least break even. The results for the two sub-periods are then compared. In the light of the earlier analysis of management motivations, it is expected that bidders in the sub-period 1980-85 were more likely to have

applied a disciplinary motive and have achieved positive or break-even wealth effects. In the second period, 1986-90, it is expected that managerial motives would have been more prominent, leading to wealth losses. This, of course, assumes that the market for corporate control is able to discern different managerial motives for proposed acquisitions, and considers the underlying strategic motivation for an acquisition to be a determinant of value.

5.1 Bidders' Share Price Performance in the Pre-bid Period

In line with the testing regime outlined in Chapter 4, the returns for bidders in the two periods prior to announcement are examined for abnormal performance.¹⁶ These results are presented in Table 6.2.

Table 6.2

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns for Pre-bid period to Announcement Date, for Sample Sub-Periods 1980-85 and 1986-90

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
<i>Panel A: Bidders' CAARs 1980-85, N=190</i>						
CAAR(-20,0)	0.004	59 ^b	0.66	-0.047	0.013	0.044
CAAR(-30,0)	0.007	60 ^a	1.02	-0.046	0.016	0.061
CAAR(-40,0)	0.007	59 ^b	0.88	-0.069	0.018	0.066
CAAR(-50,0)	0.006	61 ^a	0.54	-0.070	0.016	0.081
CAAR(-60,0)	-0.002	58 ^b	0.16	-0.090	0.011	0.070
CAAR(-70,0)	-0.006	59 ^b	0.47	-0.102	0.018	0.087
CAAR(-80,0)	-0.005	59 ^b	0.32	-0.112	0.019	0.099
<i>Panel B: Bidders' CAARs 1986-90, N=369</i>						
CAAR(-20,0)	0.007	54 ^a	1.16	-0.053	0.003	0.050
CAAR(-30,0)	0.011	53 ^a	1.22	-0.069	0.006	0.068
CAAR(-40,0)	0.013	53 ^a	1.31	-0.089	0.008	0.086
CAAR(-50,0)	0.011	53 ^a	0.92	-0.099	0.006	0.109
CAAR(-60,0)	0.007	53 ^a	0.58	-0.113	0.001	0.122
CAAR(-70,0)	0.021	54 ^a	1.32	-0.118	0.008	0.136
CAAR(-80,0)	0.022	54 ^a	1.30	-0.133	0.009	0.144

a,b,c significant at the 1%, 5%, and 10% significance levels

¹⁶ This is done, of course, to ensure that the full impact of the announcement of a bid and its consummation is captured by event windows drawn around these information events.

The equally-weighted results for the period prior to announcement are similar in both periods and to those obtained for the whole sample reported in Table 4.4. Both sets of bidders have insignificant abnormal returns close to zero, but in each case the proportion of bidders with positive returns is greater than 50 per cent, significant at the 5 per cent level or better according to the non-parametric binomial test. Examination of the quartile figures shows that the distribution of returns is also similar for both groups. On a value-weighted basis (results not reported here) the mean returns in both sub-periods are negative at around 0.5 per cent, but insignificantly different from zero by a clear margin. The value-weighted results suggest that in the pre-bid period large bidders in the samples underperform smaller bidders in the 60-day pre-bid period.

The results for the bidders in the sub-period 1980-85 are in striking contrast to those for the full 1980-90 sample reported in Table 4.9. For a period up to 20 days following the bid announcement, on average, bidders suffers losses of less than one per cent, which are not statistically significant. Over the A-C interval, bidders also suffer small, though insignificant losses of less than one per cent. For the 1980-90 sample as a whole statistically significant losses at announcement were in the order of 2 per cent and over the A-C interval the average loss increases to 3 per cent.

In Table 6.4 the valued-weighted results for the 1980-85 period, show that bidders make positive returns, though not significantly different from zero. This suggests that larger firms were more likely to achieve gains from an acquisition than smaller ones. For the full 1980-90 sample, the value-weighted results represented a statistically significant loss to bidders of approximately 2 per cent. This was slightly lower than the equal-weighted loss, again suggesting that large bidders fare better than smaller bidders.

5.2 Bidders' Abnormal Returns at Announcement and to Completion 1980-85

The abnormal returns to bidders during 1980-85, both at announcement and over the

announcement to completion interval are presented in Tables 6.3 through 6.5.¹⁷

Table 6.3

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns
(i) Relative to Announcement Date, (ii) over Announcement to Completion Interval,
for Sample Sub-Period 1980-85

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
<i>Panel A: Bidders' CAARs relative Announcement Date</i>						
CAAR1	-0.009	46	1.26	-0.059	-0.005	0.012
CAAR2	-0.009	43 ^c	1.51	-0.061	-0.005	0.013
CAAR3	-0.007	45	1.16	-0.064	-0.015	0.021
CAAR4	-0.008	38 ^a	1.33	-0.059	-0.014	0.019
CAAR5	-0.008	38 ^a	1.34	-0.055	-0.014	0.022
CAAR6	-0.004	39 ^a	0.67	-0.043	-0.016	0.024
CAAR7	-0.004	36 ^a	0.67	-0.036	-0.018	0.025
CAAR8	-0.004	39 ^a	0.67	-0.037	-0.022	0.023
CAAR9	-0.003	39 ^a	0.51	-0.038	-0.023	0.028
CAAR10	-0.004	40 ^b	0.64	-0.042	-0.021	0.025
CAAR15	-0.006	38 ^a	1.02	-0.048	-0.018	0.038
CAAR20	-0.008	34 ^a	1.13	-0.061	-0.011	0.044
<i>Panel B: Bidders' CAARs over Announcement-Completion Interval</i>						
CAARa-c	-0.009	50	1.10	-0.077	-0.001	0.048

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

These results suggest that, on average, mergers and acquisitions in the 1980-85 period were a profitable investment. However, a slight caveat does need to be entered here, in view of the non-parametric test, which shows that more than 50 per cent of bidders recorded losses around the announcement period, although this result is offset by the same test for the full announcement to completion event window.

¹⁷ All the results reported utilise the market model: the market-adjusted benchmark was also tried for each event window, but its use made no substantive difference and the results are, therefore, not reported.

Table 6.4

Bidders' Value-Weighted Market Model Cumulative Average Abnormal Returns
 (i) Relative to Announcement Date, (ii) over Announcement to Completion Interval,
 for Sample Period 1980-85

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
<i>Panel A: Bidders' CAARs relative Announcement Date</i>						
CAAR(-1,1)	0.012	46	0.81	0.002	-0.000	0.004
CAAR(-1,2)	0.007	43 ^c	0.64	-0.003	-0.000	0.004
CAAR(-1,3)	0.006	45	0.55	-0.003	-0.000	0.004
CAAR(-1,4)	0.005	38 ^a	0.51	-0.003	-0.001	0.003
CAAR(-1,5)	0.006	38 ^a	0.57	-0.003	-0.001	0.003
CAAR(-1,6)	0.009	39 ^a	0.69	-0.003	-0.001	0.003
CAAR(-1,7)	0.008	36 ^a	0.73	-0.003	-0.001	0.003
CAAR(-1,8)	0.007	39 ^a	0.70	-0.003	-0.001	0.005
CAAR(-1,9)	0.008	39 ^a	0.82	-0.003	-0.001	0.004
CAAR(-1,10)	0.005	40 ^a	0.63	-0.003	-0.001	0.007
CAAR(-1,15)	0.009	38 ^a	0.76	-0.003	-0.001	0.006
CAAR(-1,20)	0.004	34 ^a	0.36	-0.004	-0.001	0.007
<i>Panel B: Bidders' CAARs over Announcement-Completion Interval</i>						
CAARa-c	0.000	50	0.09	-0.015	0.000	0.004

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

In other UK studies, (for example Franks and Harris, 1989; Sudarsanam *et al.*, 1996), the event window at announcement is extended to encompass a period prior to the public announcement of the bid, in order to capture any anticipation by the market. For purposes of comparison a similar exercise was undertaken: the results are in Table 6.5.¹⁸ With the extended announcement event windows the equally-weighted returns to bidders are indistinguishable from zero. On a value-weighted basis the returns are negative, but at around 0.5 per cent they are also statistically insignificant. Furthermore, on this basis (with the exception of the -60,1 window) more than 50 per cent of bidders have positive returns. Despite these results, and for the reasons outlined in

¹⁸ The results for intermediate days have been excluded for reasons of space, but are of a similar order of magnitude to those reported in Table 6.4

Chapter 4, the results in Tables 6.3 and 6.4 for the narrower event windows are preferred.¹⁹

Table 6.5

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns from day -60 Pre-bid to Post-Announcement Period 1980-85

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
CAAR(-60,1)	0.000	46	0.16	-0.012	-0.001	0.011
CAAR(-60,5)	-0.002	52	0.67	-0.027	0.001	0.010
CAAR(-60,10)	-0.001	52	0.26	-0.027	0.000	0.016
CAAR(-60,15)	0.004	56 ^b	0.80	-0.037	0.005	0.023
CAAR(-60,20)	0.000	55	0.07	-0.047	0.002	0.040

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

5.3 Bidders' Announcement to Completion CAARs - 1986-90

When the 1980-85 results are compared with those for 1986-90, Tables 6.6 and 6.7, the difference is striking. Around announcement, on an equally-weighted basis, bidders during 1986-90 suffered losses of around 2 per cent or more, rising to almost 4 per cent over the full A-C interval. These results are statistically significant at the one per cent level, with only a very small proportion of the bidding firms managing to record positive abnormal returns.

On a value-weighted basis (Table 6.7) for an interval up to 20 days after announcement, the losses are slightly reduced, though still highly significant. However, over the full A-C interval the mean value-weighted and equally-weighted returns are identical, and so it appears likely that losses to small and large acquirers are of the same order of magnitude.

¹⁹ Even if the longer windows do capture anticipation, this still does not explain why bidders, on average, suffer a negative response at announcement. Whilst the market might be able to anticipate a bid, issues like the identity of the bidder, likelihood of a rival, the terms of the bid, etc. are not known, (and, given the illegality of insider trading, certainly should not be known), leaving room for a market revision of the NPV consequences of the announcement.

Table 6.6

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns
 (i) Relative to Announcement Date, (ii) over Announcement to Completion Interval,
 for Sample Sub-Period 1986-90

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
<i>Panel A: Bidders' CAARs relative Announcement Date</i>						
CAAR(-1,1)	-0.023 ^a	29 ^a	7.69	-0.055	-0.019	0.006
CAAR(-1,2)	-0.026 ^a	30 ^a	8.63	-0.059	-0.021	0.005
CAAR(-1,3)	-0.027 ^a	30 ^a	9.01	-0.072	-0.023	0.006
CAAR(-1,4)	-0.027 ^a	28 ^a	6.76	-0.068	-0.026	0.007
CAAR(-1,5)	-0.029 ^a	27 ^a	7.24	-0.064	-0.028	0.004
CAAR(-1,6)	-0.030 ^a	28 ^a	7.53	-0.058	-0.033	0.007
CAAR(-1,7)	-0.029 ^a	28 ^a	7.25	-0.062	-0.033	0.005
CAAR(-1,8)	-0.029 ^a	30 ^a	7.21	-0.063	-0.033	0.011
CAAR(-1,9)	-0.029 ^a	31 ^a	7.22	-0.069	-0.032	0.010
CAAR(-1,10)	-0.027 ^a	32 ^a	6.75	-0.066	-0.031	0.014
CAAR(-1,15)	-0.034 ^a	32 ^a	6.80	-0.086	-0.027	0.019
CAAR(-1,20)	-0.036 ^a	32 ^a	6.00	-0.096	-0.027	0.017
<i>Panel B: Bidders' CAARs over Announcement-Completion Interval</i>						
CAARa-c	-0.038 ^a	41 ^a	4.75	-0.105	-0.019	0.031

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

With the event window extended to include returns from day -60 (Table 6.8) the negative returns to bidders during 1986-90 are much reduced and are insignificantly different from zero. However, the binomial test was significant and shows that less than 50 per cent of bidders made positive returns. When this exercise is undertaken with value-weighted returns the mean loss increases to between 0.4 and 0.9 per cent, but again the results are not statistically significant.

Table 6.7

Bidders' Value-weighted Market Model Cumulative Average Abnormal Returns
(i) Relative to Announcement Date, (ii) over Announcement to Completion Interval,
for Sample Sub-Period 1986-90

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
<i>Panel A: Bidders' CAARs relative Announcement Date</i>						
CAAR(-1,1)	-0.015 ^a	29 ^a	3.00	-0.019	-0.003	0.001
CAAR(-1,2)	-0.018 ^a	30 ^a	3.62	-0.020	-0.003	0.001
CAAR(-1,3)	-0.019 ^a	30 ^a	3.83	-0.020	-0.004	0.001
CAAR(-1,4)	-0.021 ^a	28 ^a	3.49	-0.022	-0.004	0.001
CAAR(-1,5)	-0.025 ^a	27 ^a	3.58	-0.025	-0.004	0.000
CAAR(-1,6)	-0.028 ^a	28 ^a	3.50	-0.028	-0.004	0.001
CAAR(-1,7)	-0.029 ^a	28 ^a	2.91	-0.026	-0.004	0.001
CAAR(-1,8)	-0.027 ^a	30 ^a	2.46	-0.024	-0.003	0.001
CAAR(-1,9)	-0.021 ^a	31 ^a	2.63	-0.025	-0.004	0.002
CAAR(-1,10)	-0.021 ^a	30 ^a	2.33	-0.025	-0.004	0.002
CAAR(-1,15)	-0.025 ^a	31 ^a	2.78	-0.025	-0.005	0.003
CAAR(-1,20)	-0.027 ^a	30 ^a	3.03	-0.031	-0.006	0.003
<i>Panel B: Bidders' CAARs over Announcement-Completion Interval</i>						
CAARa-c	-0.038 ^a	41 ^a	2.38	-0.030	-0.003	0.005

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

Table 6.8

Bidders' Equally-weighted Market Model Cumulative Average Abnormal Returns from
day-60 Pre-bid to Post-Announcement Period 1986-90

CAARn	Mean	% +	t-value	1st Qtile	Median	3rd Qtile
CAAR(-60,1)	-0.002	41 ^a	1.12	-0.025	-0.001	0.009
CAAR(-60,5)	-0.003	43 ^b	1.05	-0.027	-0.002	0.019
CAAR(-60,10)	-0.001	44 ^b	0.21	-0.039	-0.001	0.024
CAAR(-60,15)	-0.006	44 ^b	1.41	-0.047	-0.002	0.034
CAAR(-60,20)	-0.003	47 ^c	1.09	-0.055	-0.002	0.042

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

5.4 Bidders' Post-completion CAARs - 1980-85

The results from the event study tests of the post-completion returns 1980-85 are set out in Tables 6.9 and 6.10. Using the market model benchmark (Table 6.9) the equally-weighted abnormal returns to acquirers during 1980-85 are negative, but statistically significant on a consistent basis only from day +60, rising to a loss of 9 per cent at day +200. On a value weighted basis the returns are economically substantial, but not statistically significant.

The pattern of the value-weighted returns is such that comparison with the equally-weighted version does not yield a consistent picture about the relative performance of large versus small acquiring firms. Up to day +100 the value-weighted returns are on the whole slightly larger, suggesting that large firms suffer greater losses. However, from day +120 to day+200 the value-weighted returns are lower than the equally-weighted versions, suggesting that, on average, larger firms have better performance than smaller firms.

Comparing these results with the market model results for the full sample period, it is clear that acquirers during 1980-85 suffered much lower losses, both on equally-weighted and value-weighted bases.

This reversal in the pattern of equally- versus value-weighted post-completion returns was examined further. For UK data, Franks and Harris (1989) suggest that post-completion returns are dependent on the benchmark, and so the market-adjusted was also applied. Unfortunately, when this was done the picture becomes slightly more complicated, because the results generated by the market-adjusted benchmark are both qualitatively and quantitatively different from those obtained with the market model. They are reported in Table 6.10.

Table 6.9

Bidders' Equally-Weighted & Value-Weighted Market Model Cumulative Average Abnormal Returns Relative to Completion Date for Sample Period 1980-85

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
CAAR(0,1)	-0.001	38 ^a	0.46	0.001	38 ^a	0.24
CAAR(0,10)	-0.004	34 ^a	1.07	0.000	34 ^a	0.02
CAAR(0,20)	-0.012 ^c	36 ^a	1.71	-0.016	36 ^a	1.59
CAAR(0,30)	-0.008	39 ^a	0.89	-0.018	39 ^a	1.13
CAAR(0,40)	-0.013	38 ^a	1.18	-0.020	38 ^a	1.05
CAAR(0,50)	-0.016	39 ^a	1.33	-0.013	39 ^a	0.82
CAAR(0,60)	-0.025 ^c	40 ^a	1.92	-0.031	40 ^a	1.07
CAAR(0,70)	-0.027 ^c	40 ^a	1.80	-0.036	40 ^a	0.90
CAAR(0,80)	-0.032 ^c	40 ^a	1.88	-0.053	40 ^a	1.36
CAAR(0,90)	-0.026	38 ^a	1.36	-0.046	38 ^a	1.12
CAAR(0,100)	-0.035 ^c	39 ^a	1.75	-0.042	39 ^a	1.24
CAAR(0,120)	-0.051 ^b	41 ^a	2.21	-0.037	41 ^a	0.88
CAAR(0,140)	-0.066 ^a	38 ^a	2.53	-0.056	38 ^a	1.27
CAAR(0,160)	-0.082 ^a	39 ^a	2.83	-0.067	39 ^a	1.59
CAAR(0,180)	-0.087 ^a	38 ^a	2.72	-0.061	38 ^a	1.27
CAAR(0,200)	-0.093 ^a	38 ^a	2.74	-0.048	38 ^a	0.94

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

On the basis of the equally-weighted market-adjusted returns, for acquisitions completed during 1980-85, acquirers made small gains of up to 2 per cent at the end of the 200 day event window. On a value-weighted basis the returns fluctuate between negative and positive, but in any event are not statistically significant. Although it is not absolutely clear-cut, a comparison of the equally and value-weighted returns suggests that on balance larger firms might have done slightly worse, but the difference between the two weightings is not reversed as with the market model returns.

Table 6.10

Bidders' Equally-Weighted & Value-Weighted Market-Adjusted Model Cumulative Average Abnormal Returns Relative to Completion Date for Sample Period 1980-85

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
CAAR(0,1)	0.000	70 ^a	0.29	0.000	70 ^a	0.75
CAAR(0,10)	0.003	56 ^b	0.75	0.006	56 ^b	0.86
CAAR(0,20)	0.002	43 ^c	0.29	-0.006	43 ^c	0.75
CAAR(0,30)	0.010	44 ^c	1.11	-0.006	44 ^c	0.46
CAAR(0,40)	0.011	46	1.00	-0.011	46	0.85
CAAR(0,50)	0.014	45	1.27	0.005	45	0.33
CAAR(0,60)	0.010	44 ^c	0.83	-0.010	44 ^c	0.43
CAAR(0,70)	0.014	43 ^c	1.08	-0.017	43 ^c	0.68
CAAR(0,80)	0.015	45	1.15	-0.024	45	1.00
CAAR(0,90)	0.025	45	1.67	-0.016	45	0.64
CAAR(0,100)	0.020	42 ^b	1.26	-0.006	42 ^b	0.22
CAAR(0,120)	0.016	41 ^b	0.94	0.003	41 ^b	0.14
CAAR(0,140)	0.014	44 ^c	0.82	-0.002	44 ^c	0.07
CAAR(0,160)	0.011	46	0.58	-0.007	46	0.20
CAAR(0,180)	0.014	47	0.74	0.005	47	0.14
CAAR(0,200)	0.018	45	0.95	0.015	45	0.45

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

The differences in the post-outcome results generated by the two benchmarks is consistent with the findings of most other UK studies, (for example, Franks and Harris, 1989; Limmack, 1991), although Gregory (1997) reports unambiguously negative and statistically significant results. Given that there is no easy resolution of the issue about which is the most effective benchmark, (even though some form of risk adjustment would seem to be a more appropriate assumption, than that all firms are of equal risk), it would perhaps be safer to conclude simply that the post-outcome performance of bidders in the 1980-85 sub-period is an open question.

5.5 Bidders' Abnormal Returns Post-completion 1986-90

In the case of the acquisitions completed during 1986-90, fairly clear conclusions can be drawn

about the performance of acquirers. The market model results in Table 6.11 show large and statistically significant losses, on both equally- and value-weighted bases. The latter are smaller than the former, suggesting that larger firms suffered smaller losses. The market-adjusted benchmark results (Table 6.12) confirm this finding: acquiring firms make statistically significant losses, with larger firms losing less than smaller firms.

Table 6.11

Bidders' Equally-Weighted & Value-Weighted Market Model Cumulative Average Abnormal Returns Relative to Completion Date for Sample Period 1986-90

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
CAAR(0,1)	-0.003	42 ^a	1.56	-0.002	42 ^a	0.66
CAAR(0,10)	-0.016 ^a	38 ^a	4.05	-0.012 ^b	38 ^a	1.71
CAAR(0,20)	-0.030 ^a	36 ^a	5.09	-0.024 ^b	36 ^a	2.00
CAAR(0,30)	0.049 ^a	36 ^a	5.44	-0.034 ^a	36 ^a	2.71
CAAR(0,40)	-0.063 ^a	37 ^a	6.30	-0.038 ^a	37 ^a	3.06
CAAR(0,50)	-0.071 ^a	36 ^a	5.92	-0.052 ^a	36 ^a	2.82
CAAR(0,60)	-0.084 ^a	39 ^a	6.00	-0.048 ^a	39 ^a	2.71
CAAR(0,70)	-0.091 ^a	36 ^a	5.92	-0.057 ^a	36 ^a	3.05
CAAR(0,80)	-0.103 ^a	35 ^a	6.06	-0.067 ^a	35 ^a	3.00
CAAR(0,90)	-0.116 ^a	36 ^a	6.11	-0.078 ^a	36 ^a	3.08
CAAR(0,100)	-0.129 ^a	36 ^a	6.45	-0.080 ^a	36 ^a	2.96
CAAR(0,120)	-0.160 ^a	36 ^a	6.96	-0.091 ^a	36 ^a	3.14
CAAR(0,140)	-0.180 ^a	35 ^a	6.92	-0.100 ^a	35 ^a	4.00
CAAR(0,160)	-0.208 ^a	35 ^a	7.17	-0.123 ^a	35 ^a	4.24
CAAR(0,180)	-0.245 ^a	35 ^a	7.42	-0.125 ^a	35 ^a	4.17
CAAR(0,200)	-0.271 ^a	36 ^a	7.53	-0.153 ^a	36 ^a	4.64

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

Table 6.12

Bidders' Equally-Weighted & Value-Weighted Market-Adjusted Model Cumulative Average Abnormal Returns Relative to Completion Date for Sample Period 1986-90

CAARn	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
CAAR(0,1)	-0.001	53	0.52	-0.002	53	0.67
CAAR(0,10)	-0.008 ^b	42 ^a	2.00	-0.008	42 ^a	1.14
CAAR(0,20)	-0.014 ^a	43 ^b	2.31	-0.015 ^c	43 ^b	1.70
CAAR(0,30)	-0.023 ^a	41 ^a	2.88	-0.023 ^c	41 ^a	1.92
CAAR(0,40)	-0.028 ^a	44 ^b	3.11	-0.029 ^c	44 ^b	1.93
CAAR(0,50)	-0.025 ^a	43 ^b	2.52	-0.021 ^c	43 ^b	1.70
CAAR(0,60)	-0.027 ^a	44 ^b	2.45	-0.024 ^c	44 ^b	1.73
CAAR(0,70)	-0.024 ^b	44 ^b	2.02	-0.027	44 ^b	1.59
CAAR(0,80)	-0.025 ^b	43 ^b	1.92	-0.032 ^c	43 ^b	1.68
CAAR(0,90)	-0.030 ^b	42 ^a	2.14	-0.031 ^c	42 ^a	1.65
CAAR(0,100)	-0.033 ^b	44 ^b	2.21	-0.034	44 ^b	1.62
CAAR(0,120)	-0.049 ^a	40 ^a	3.06	-0.025 ^c	40 ^a	1.70
CAAR(0,140)	-0.050 ^a	41 ^a	3.12	-0.020 ^c	41 ^a	1.65
CAAR(0,160)	-0.060 ^a	44 ^b	3.33	-0.031 ^c	44 ^b	1.82
CAAR(0,180)	-0.082 ^a	43 ^b	4.05	-0.021 ^c	43 ^b	1.77
CAAR(0,200)	-0.090 ^a	41 ^a	4.50	-0.035 ^c	41 ^a	1.84

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

Despite the slightly contradictory results for the earlier period, it is clear that the post-outcome results for successful bidders from the 1986-90 sub-period are considerably worse than those for their counterparts from the 1980-85 sub-period. The unambiguous nature of the findings for 1986-90 are consistent with those reported by Gregory (1997), but are at odds with the rather mixed results obtained by Franks and Harris (1989) and Limmack (1991).

6. NET CASH WEALTH EFFECTS

In this section the net value effects of mergers and acquisitions are examined for the two sub-periods. The value gains (losses) to bidders, to targets, and to each matched bidder-target pair are calculated by using the market value of equity from the *Datastream* database 60 days prior to bid

announcement. This is then multiplied by the abnormal returns cumulated over three different event windows, (-60,5), (-1,5), and (A-C interval).

6.1 Net Wealth Effects 1980-85

The value impacts for targets and bidders involved in acquisitions completed during 1980-85, together with the net or aggregated value gains, losses and transfers are presented in Table 6.13.

Table 6.13

Value (£million) Wealth Gains/Losses to Shareholders of Bidders, Targets, and Matched Pairs of Bidders and Targets. Sample Sub-Period 1980-85.

	Mean	<i>t</i> -value	%+	1st Qtile	Median	3rd Qtile
<i>Panel A: Value Gains measured from day -60 to day +5</i>						
Bidders	1.043	0.84	52	-1.794	0.007	0.428
Targets	0.923 ^a	11.83	84 ^a	0.145	1.179	1.259
Combined	1.966	1.43	64 ^a	-1.442	0.543	1.606
<i>Panel B: Value Gains measured from day -1 to day +5</i>						
Bidders	2.076	0.51	38 ^a	-7.476	-0.484	1.034
Targets	14.773 ^a	12.80	89 ^a	2.556	17.973	19.126
Combined	16.849 ^a	4.09	74 ^a	-0.104	9.765	18.537
<i>Panel C: Value Gains measured over Announcement-Completion Interval</i>						
Bidders	1.249	0.32	50	-5.200	0.000	1.341
Targets	6.592 ^a	13.00	85 ^a	1.104	6.985	8.606
Combined	7.829 ^b	2.01	68 ^a	-1.926	3.418	8.988

N=190 a,b,c significant at the 1%, 5%, and 10% significance levels

For the earlier period, 1980-85, the results in Table 6.13 provide unequivocal evidence that mergers and acquisitions were value enhancing events. Regardless of the abnormal return that is used to calculate the value changes, the combined value impact for pairs of bidders and targets is positive and statistically significant for two of the measures. This stands in contrast to the findings of Limmack (1991). Target shareholders make substantial value gains, significant at the one per cent level for all three measures. Of more interest is the result that on average bidder shareholders also make gains, although they are only statistically different from zero for one of

the three measures. This finding also contradicts the results obtained by Limmack (1991) for a UK sample over 1977-86, and an earlier study by Firth (1980) who found that target gains were largely at the expense of bidders.²⁰

6.2 Net Value Effects 1986-90

The net value impacts for targets and bidders involved in acquisitions completed during 1986-90, together with the paired net value wealth gains, losses and transfers are presented in Table 6.14.

Table 6.14

Value (£million) Wealth Gains/Losses to Shareholders of Bidders, Targets, and Matched Pairs of Bidders and Targets. Sample Sub-Period 1986-90.

	Mean	t-value	%+	1st Qtile	Median	3rd Qtile
<i>Panel A: Value Gains measured from day -60 to day +5</i>						
Bidders	-1.206	0.99	43 ^b	-2.657	-0.060	1.933
Targets	1.512 ^a	3.43	90 ^a	0.058	0.569	1.179
Combined	0.306	0.87	58 ^a	-2.431	0.418	3.830
<i>Panel B: Value Gains measured from day -1 to day +5</i>						
Bidders	-11.715 ^a	3.46	38 ^a	-11.484	-1.936	0.142
Targets	22.844 ^a	5.87	89 ^a	2.099	10.464	17.973
Combined	11.129 ^a	2.73	74 ^a	-3.284	4.281	17.842
<i>Panel C: Value Gains measured over Announcement-Completion Interval</i>						
Bidders	-10.361 ^a	3.98	41 ^a	-13.522	-1.429	2.539
Targets	13.996 ^a	6.25	93 ^a	1.046	6.520	9.003
Combined	3.635	1.12	62 ^a	-5.780	3.351	11.965

N=369 a,b,c significant at the 1%, 5%, and 10% significance levels

The results for the 1986-90 period, Table 6.14, suggest that mergers and acquisitions had positive net value outcomes against all three measures, but an overall wealth gain is only statistically significant for the measure based on announcement period returns. An important feature of the

²⁰ Of course these measures do not include transactions costs, which Kay (1988) argues are substantial.

results is the substantial redistribution of wealth from the shareholders of acquirers to the shareholders of the target firms. Against each wealth measure target shareholders make substantial gains, all statistically significant at the one per cent level. In contrast bidder shareholders suffer losses against all three measures, although in only two cases are the losses statistically significant. The inclusion of transactions cost would clearly exacerbate these losses. In contrast to the findings for 1980-85, these results are broadly in line with those from earlier UK studies, (Firth, 1980; Limmack, 1991).

A comparison of the 1980-85 and 1986-90 changes in net shareholder value show clearly that the outcomes for shareholders of acquiring firms were very different in the two periods, and are broadly supportive of the hypotheses developed in sections 3 and 4 above. In the next section the issue of relatedness and its impact on shareholders' wealth is re-examined.

7. THE IMPACT OF RELATEDNESS DURING 1980-85 & 1986-90

The impact of industry relatedness on shareholder wealth and as a discriminator for relative pre-acquisition performance was investigated for the full 1980-90 sample in Chapters 4 and 5. Recall that the relatedness hypothesis is predicated on modern portfolio theory which suggests that shareholders will not value diversification by firms, as this is something that they can achieve more efficiently and effectively in financial assets. On this basis diversifying mergers are likely to be symptomatic of agency problems. Weak support for the relatedness hypothesis has been found in the UK by Sudarsanam *et al.* (1996), (for the US see Morck *et al.*, 1990). However, the results from Chapters 4 and 5 provided little support for the relatedness hypothesis, which is consistent with the work reported by Limmack (1990) and Limmack and McGregor (1995). Following on from the work reported in earlier sections, the purpose here is to re-examine the relatedness issue taking account of calendar time via business cycle and merger cycle effects.

7.1 Relatedness and Wealth Effects

The abnormal returns around announcement and up to completion are investigated for bidders involved in related and unrelated acquisitions in the two periods, 1980-85 and 1986-90. The

results are presented in Tables 6.15 and 6.16.²¹

Table 6.15

Equally-weighted and Value-weighted Market Model Cumulative Average Abnormal Returns for Bidders in Related & Bidders in Unrelated Acquisitions (i) Relative to Announcement Date, (ii) over Announcement to Completion Interval, for Sample Period 1980-85.

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
<i>Panel A: Related Bidder Returns relative to Announcement Date (N=77)</i>						
CAAR(-1,1)	-0.007	57 ^b	1.17	-0.008	57 ^b	1.00
CAAR(-1,5)	-0.003	49	0.43	-0.001	49	0.13
CAAR(-1,10)	0.005	52	0.56	0.016 ^c	52	1.78
CAAR(-1,15)	0.003	49	0.31	0.017 ^c	49	1.89
CAAR(-1,20)	0.001	45 ^c	0.09	0.014	45 ^c	1.17
<i>Panel B: Related Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	0.012	51	0.86	0.014	51	1.08
<i>Panel C: Unrelated Bidder Returns relative to Announcement Date (N=113)</i>						
CAAR(-1,1)	-0.010	53	1.43	0.006	53	1.04
CAAR(-1,5)	-0.011	45	1.38	-0.010	45	0.56
CAAR(-1,10)	-0.009	45	1.00	-0.002	45	0.15
CAAR(-1,15)	-0.012	42 ^b	1.33	-0.004	42 ^b	0.21
CAAR(-1,20)	-0.014	44 ^c	1.40	-0.002	44 ^c	0.13
<i>Panel D: Unrelated Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.023 ^b	39 ^a	1.92	-0.009	39 ^a	0.53

^{a, b, c} significant at 1, 5, 10 per cent levels

For the period 1980-85, the equally-weighted abnormal returns for related acquirers are not significantly different from zero. On a value-weighted basis the results suggest that, on average,

²¹ The abnormal returns in the period prior to announcement was also examined for related and unrelated groups, but there was no quantitative or qualitative differences between the results obtained and those originally reported for the full sample in Chapter 4, and so they are not reported here.

larger firms achieved slightly higher returns. The proportion of firms with positive returns is around 50 per cent, so that there was an even chance of related acquisitions generating either small losses or gains for shareholders. These findings are in marked contrast to the results obtained for the full 1980-90 sample, when related bidders suffered statistically significant losses of 3.8 and 1.8 per cent respectively on equally- and value-weighted bases.

For unrelated acquirers during 1980-85 the wealth effects were negative. On an equally-weighted basis unrelated bidders lose 2.3 per cent when the return is measured over the full A-C interval, significant at the 5 per cent level, with fewer than 40 per cent achieving positive returns, (significant at the one per cent level). When the event window is drawn more narrowly around announcement, losses of about one per cent are not statistically significant. The value-weighted results also show statistically insignificant losses and, as with related acquisitions, it appears that larger acquirers fared better.

The 1980-85 results are consistent with the UK study by Sudarsanam *et al.* (1996), who find that relatedness has a positive impact on shareholder wealth for a sub-sample of their data. However, the results are not consistent with Limmack and McGregor (1995) who find strong evidence for the reverse; nor with Limmack (1990) who finds weak evidence in favour of unrelated acquisitions for a 1981-86 sub-sample.

The results for the 1986-90 period are presented in Table 6.16.

The 1986-90 results are very different from those for the earlier period, with both related and unrelated acquirers suffering statistically significant losses. In the case of related transactions, acquirers lost around 4 per cent on an equally-weighted basis, rising to over 5 per cent in value-weighted terms. Thus it appears that, on average, larger bidders suffered higher losses than smaller bidders, which is the reverse of the 1980-85 results. Only 35 per cent of related bidders achieved a positive return in the 1986-90 sample.

Table 6.16

Equally-weighted and Value-weighted Market Model Cumulative Average Abnormal Returns for Bidders in Related & Bidders in Unrelated Acquisitions (i) Relative to Announcement Date, (ii) over Announcement to Completion Interval, for Sample Period 1986-90.

CAAR(t,T)	Equally-weighted			Value-weighted		
	Mean	% +	t-value	Mean	%+	t-value
<i>Panel A: Related Bidder Returns relative to Announcement Date (N=158)</i>						
CAAR(-1,1)	-0.024 ^a	33 ^a	6.02	-0.017 ^b	33 ^a	2.43
CAAR(-1,5)	-0.033 ^a	28 ^a	5.56	-0.040 ^a	28 ^a	2.86
CAAR(-1,10)	-0.030 ^a	32 ^a	5.08	-0.033 ^c	32 ^a	1.74
CAAR(-1,15)	-0.038 ^a	32 ^a	4.75	-0.037 ^b	32 ^a	1.95
CAAR(-1,20)	-0.041 ^a	35 ^a	5.13	-0.036 ^b	35 ^a	2.03
<i>Panel B: Related Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.043 ^a	39 ^a	3.91	-0.056 ^c	39 ^b	1.81
<i>Panel C: Unrelated Bidder Returns relative to Announcement Date (N=211)</i>						
CAAR(-1,1)	-0.021 ^a	39 ^a	5.25	-0.013 ^c	39 ^a	1.86
CAAR(-1,5)	-0.027 ^a	35 ^a	5.40	-0.014 ^c	35 ^a	2.00
CAAR(-1,10)	-0.024 ^a	36 ^a	4.00	-0.012 ^c	36 ^a	1.71
CAAR(-1,15)	-0.030 ^a	35 ^a	4.29	-0.015 ^c	35 ^a	1.86
CAAR(-1,20)	-0.033 ^a	33 ^a	3.67	-0.020 ^b	33 ^a	2.52
<i>Panel D: Unrelated Bidder Returns over Announcement to Completion Interval</i>						
CAAR(a-c)	-0.037 ^a	35 ^a	3.36	-0.024 ^a	35 ^a	3.03

^{a, b, c} significant at 1, 5, 10 per cent levels

In the case of unrelated transactions, the main thing of note is that although the acquirers made statistically significant losses, these were lower than the losses suffered by the related bidders. Furthermore, the value-weighted returns suggest that, on average, larger bidders suffered smaller losses, which is consistent with the equivalent 1980-85 results.

The 1986-90 results have some similarities with the results from Limmack and McGregor (1995), where unrelated bidders achieved considerably better returns than related bidders, over the period

1977-86. However, the superior results for unrelated acquirers are not consistent with recent UK survey data, (Coopers & Lybrand, 1993), which revealed that 45 per cent of senior executives from 100 large UK acquirers cite lack of knowledge of a target's industry or sector as a major cause of their failed acquisitions.

Better abnormal returns to unrelated bidders have also been found in US studies (Elgers and Clark, 1980; Kusewitt, 1985), but most US studies have found clear support for the relatedness hypothesis, (Lahey and Conn, 1990; Scanlon *et al.*, 1989; Sicherman and Pettway, 1987). Furthermore, the pattern of results from US studies suggest that more recent data exhibits stronger support for the relatedness hypothesis, (Shleifer and Vishny, 1991; Morck *et al.*, 1990).

According to orthodox finance theory, the better performance of UK unrelated bids in 1986-90 represents something of a puzzle. One explanation might be that when managerial rather than disciplinary motives are to the fore, bidders chasing related targets tend to over-value synergistic potential that they perceive to be available in a related acquisition. This could be seen as an extension of the *hubris hypothesis* first advanced by Roll (1986), (even though no account is taken of characteristics such as relatedness in the formulation of his model). To test this overpayment hypothesis, a standardized version of the merger premium paid (the premium divided by the market value of the target) was constructed for related and unrelated transactions, and then subjected to a difference of means test. This showed that, on average during 1986-90, related bidders were prepared to pay premiums 48 per cent higher than unrelated bidders. This difference was significant at the 8 per cent level, (t -value = 1.76). Given that no such difference was discernible for the 1980-85 sample, this evidence provides modest support for an over-payment explanation for the larger losses to related acquisitions during 1986-90.

8. SUMMARY & CONCLUDING REMARKS

One of the stylised facts about M&A activity is that it fluctuates over time. The statistical studies of time series data have demonstrated that these fluctuations come in definite waves or cycles. The evidence from the literature on the determinants of M&A wave patterns is rather less clear-cut, but does suggest that the pattern of activity has systematic causes. Despite this evidence, the

literature on the economic consequences of mergers and acquisitions has almost singularly failed to take account of the time series evidence. The primary aim of the chapter has been to address this omission by examining the influence of calendar time on the wealth outcomes for shareholders.

Prior to the empirical work, an attempt was made to establish a theoretical point of departure for the assertion that returns to merger activity will vary over time. The hypothesis was advanced that merger returns are related directly to variations in macroeconomic activity and to activity levels in the market for corporate control. This hypothesized relationship was underpinned by another which posits that the motives, strategies, risk assessment and risk preferences of bidder management teams vary systematically with respect to the general economic conditions and to their firms' performances relative to a universe of peers. These ideas were examined in some detail via the prospect theory of Kahneman and Tversky (1979) and the investment model of Grinyer (1986), together with various strands of empirical evidence about how firms respond to changes in the economic climate.

Having established that the data for the 1980-90 presented a good opportunity to investigate the influences of the business cycle and conditions in the market for corporate control, the data sample was divided into two periods: 1980-85 and 1986-90. This division of the data was made with reference to the time series data on aggregate M&A activity, and also the economic conditions that had prevailed over the 1980-90 period. The investigative method then involved undertaking the same event study tests on the two data sub-samples.

The results reported at announcement for 1980-85 were in striking contrast to those reported in Chapter 4 for the full 1980-90 sample. Over the 1980-90 period bidders suffered statistically significant losses of 2 to 3 per cent. In the 1980-85 period the losses were less than one per cent on an equally-weighted basis and marginally positive when value-weighted, although statistically insignificant for both versions. The difference between equally- and value-weighted returns suggested that larger acquirers, on average, performed better than their smaller counterparts.

The post-merger results for 1980-85 were rather confusing. Using the market model benchmark,

successful acquirers made statistically significant losses from day +60 after completion. By day + 200 these losses rose to an average of 9 per cent on an equally-weighted basis and 5 per cent on a value-weighted measure. However, when the market-adjusted model benchmark was applied, the CAARs were mostly positive, though statistically insignificant. The contradictory results generated by the two benchmarks makes interpretation of the post-merger results difficult. Confusing sets of results have been reported in earlier UK studies, (Franks and Harris, 1989), and recent simulation evidence suggests that test statistics based on a benchmark that utilises a market index could be misspecified, (Barber and Lyon, 1997). It has also to be recognised that the problem of attributing post-merger price movements to a merger event becomes more problematic the longer the event window, (discussed in some detail in Chapter 4). For that reason announcement period CAARs are more in keeping with the event study methodology, with results relying on longer test windows more appropriately thought of as an association study.

The announcement period results for 1986-90 showed bidders with substantial losses of over 3 per cent on an equally-weighted basis, and a little over 2 per cent on a value-weighted basis, both statistically significant. For the post-merger event window acquiring firms also suffered large, statistically significant losses estimated with both market model and market-adjusted model benchmarks, although losses measured with the latter were about 50 per cent lower.

The pattern of results reported for the CAAR measures is replicated with the net value measures. The aggregate value effects (bidders plus targets) for the 1980-85 period are, on average, positive. The gains to bidders are only significantly different from zero on one measure, but it is clear that the gains to targets were not achieved at the expense of acquirer shareholders. In contrast, over the 1986-90 period target gains were clearly made at the expense of acquiring shareholders. Nevertheless, the aggregate value effects are still positive for the 1986-90 period, which suggests that while on average the market judged the acquisitions to have had some economic merits, the terms and consequences of the acquisitions were against the interests of the acquirers.

The impact of industry relatedness on shareholder wealth effects was also re-examined in this chapter. For the full 1980-90 sample (Chapter 4) there was little difference in the magnitude of

the statistically significant losses suffered by both related and unrelated acquirers, although the value-weighted results suggested that large unrelated acquirers fared worse than any other group. In contrast the results for 1980-85 show a clear advantage to related acquirers, with mean returns insignificantly different from zero and 50 per cent achieving positive gains. For unrelated acquirers losses are substantial and statistically significant. Thus the data provides clear support for the relatedness hypothesis in this period. Such support was not, however, found for 1986-90. In this period both groups suffered statistically significant losses, with negative returns for related acquirers reaching -5.6 per cent on a value-weighted basis. It was suggested that one explanation for this apparently perverse result might be accounted for by *hubris* on the part of management teams of related acquirers, which lead them to pay too high a premium. The significant difference in the average premiums paid for related acquisitions in 1980-85 and 1986-90 provided some support for this interpretation of the evidence.

Taken as a whole, these results confirm the main hypotheses set out at the beginning of the chapter. The impact on shareholder wealth is clearly influenced in a direct way by the date of acquisition. The results are consistent with the management displacement or disciplinary hypothesis for the period 1980-85, but consistent with management growth objectives during 1986-90. The results find a resonance with Jensen (1986a), who suggested that mergers can be symptomatic of agency problems, as well as a means to resolve them. Using the equilibrium-disc equilibrium paradigm set out in sections 2 and 3, the period 1980-85, when the disciplinary hypothesis seems to hold, might be considered an equilibrium phase of the merger cycle. By the same token, 1986-90, when aggregate M&A activity increased dramatically, might be thought of as a period of disequilibrium, when managerial interests displaced the disciplinary function of the takeover market. In the next chapter the financial characteristics of bidder and targets will be re-examined in an effort to corroborate these share price results.

CHAPTER 7

Time and the Disciplinary Hypothesis: Tests with Accounting Data

1. INTRODUCTION

In the previous chapter the wealth effects for shareholders of successful bidders were shown to have been time dependent, with statistically significant gains achieved in the period 1980-85, but statistically significant losses suffered in 1986-90. In the light of these results, the main purposes of this chapter are (i) to examine the financial characteristics of bidders and targets to see if this time pattern is replicated; (ii) to see if the accounting data can be used to illuminate and explain the event study results; and (iii) to re-examine the relatedness hypothesis with accounting data.

The pattern of abnormal returns to bidders reported in Chapter 6 were consistent with the proposition that management motives and strategies for mergers and acquisitions vary over time. Specifically, *prima facie* evidence was presented to suggest that disciplinary, or quasi-disciplinary motives prevailed during 1980-85, but that non-maximising, managerial motives were dominant in the period 1986-90. In this chapter corroboration is sought for those results via the use of accounting data.

Recall that both versions of the management displacement hypothesis (MDH) require that bidders be characterised by superior management skills. On the assumption that superior management ability will be reflected in published accounting data in the period prior to a bid, bidders should at least exhibit better performance than their intended targets. Although superior pre-bid performance does not *prove* that bidders are motivated by a disciplinary intent, it is at least consistent with it. By the same token, though evidence that bidders did not have superior

pre-bid performance does not *prove* that non-maximising managerial motivations were at play, it is at least consistent with such an interpretation.

As well as examining the pre-bid accounting data of bidders and targets for the periods 1980-85 and 1986-90, the impact of industry relatedness between bidder and target is also examined as an additional test of management motivation and strategy. Modern finance theory suggests that firms should only do for shareholders that which the latter are unable to do for themselves. Given that diversification in financial assets can be both more efficient, more effective, and more complete than diversification via productive assets, it follows that unrelated acquisitions are, on average, unlikely to be regarded as value-enhancing by the market for corporate control, and are *prima facie* likely to be consistent with a non-maximising, managerial strategy, (Brealey and Myers, 1991: 307)¹.

The method and procedures first applied during the examination of the accounting data in Chapter 5 are utilised again here. The accounting data is subjected to factor analysis in order to overcome the problem of high levels of correlation typically found between various accounting variables. This procedure provides a set of orthogonal factors or composite variables, that can be used subsequently in logistic regression models, which are employed as a device to search for systematic differences between the pre-bid performances of bidders and targets.

The rest of the chapter is divided up as follows. First, logistic regression is used to discriminate between the pre-bid performances of bidders and targets in the sub-periods 1980-85 and 1986-90. These results are then examined in detail and compared with the share-price results obtained in the previous chapter. In the following section the issue of industrial relatedness is examined for the two periods with accounting data. The final section provides a brief summary and some concluding remarks.

¹ But see also, for example, Weston *et al.* (1990: 75), for a resume of the *ad hoc* rationales that have been advanced in support of diversification in productive assets.

2. COMPARING PRE-BID PERFORMANCES OF BIDDERS & TARGETS

In this section separate comparisons are made of the pre-bid performances of targets and bidders, for the periods 1980-85 and 1986-90. In the first instance a univariate analysis of the accounting data is undertaken to investigate the basic patterns of difference between the two groups. Next factor analysis and logistic regression are used as statistical filters to discriminate between the performances of targets and bidders. In addition to accounting ratios, a number of other variables (for example, market-to-book ratio, dividend payout) are also tested for discriminatory power. However, the pattern originally identified in Chapter 5, (the four accounting factors, a growth proxy and size), continues, for the most part, to be the best multivariate combination in terms of discriminatory power.

2.1 The Pre-bid Performances of Targets vs Bidders 1980-85

The first stage in the comparative analysis is to examine the univariate differences between targets and bidders as measured by various accounting ratios, with the differences in means subjected in series to a standard *t*-test. The results of this analysis are presented in Table 7.1.

Table 7.1

Univariate Group Differences between Bidders and Targets on Industry-Standardised Accounting Variables over 3-year Period Prior to Bid Announcement and for Year Prior to Announcement, for the Period 1980-85.

Variable	3-year Mean			1-year Pre-bid		
	Bidders	Targets	Difference	Bidders	Targets	Difference
RROE	1.1646	0.8135	0.3510 ^a	1.1223	0.7615	0.3608 ^a
RROC	1.0889	0.9416	0.1473 ^a	1.0652	0.9152	0.1449 ^a
RTPM	1.1792	0.9438	0.2355 ^a	1.1927	0.8977	0.2950 ^a
ROPM	1.1914	0.9352	0.2562 ^a	1.1268	0.9061	0.2207 ^a
RNPM	1.2200	0.8250	0.3950 ^a	1.2233	0.7571	0.4662 ^a
RCFM	1.1727	0.9378	0.2349 ^b	1.1910	0.8990	0.2920 ^a
RTAE	1.0082	1.0603	0.0522	0.9564	1.0665	0.1102
RGEAR	0.9699	0.8865	0.0835	1.0218	0.7607	0.2611 ^a

^a significant at 1 per cent level ^b significant at 5 per cent level ^c significant at 10 per cent level

On a univariate basis bidders clearly outperformed targets in this period, both over the 3-year average and in the final year prior to a bid. For all performance measures bar one (FTAE), there is a statistically significant difference between the two groups. In addition, bidders' performances were above the industry averages, whereas the target group underperformed industry norms. Another noticeable feature of these results is the way that the average target performance deteriorated in the final year before a bid was launched. Whilst the caveat about a univariate series of *t*-tests should be taken into account, there is sufficient *prima facie* evidence here to suggest that further, multivariate analysis would be worthwhile.

Consequently the FACTOR ANALYSIS procedure from SPSS for Windows was used to provide composite variables or factors from the accounting data. The diagnostic statistics show that the factor analysis for the 1980-85 sample is a valid procedure: the Kaiser-Meyer-Olkin measure of sampling adequacy measure (KMO) takes a healthy value of 0.7853, with a Bartlett test statistic of 8,587.52, (p -value = 0.0000)². The four factors identified by the procedure together accounted for 88 per cent of the total variance.

The four accounting factors, return on revenue (FROS), return on capital (FROC), asset utilisation (FTAE), and financial gearing (FGEAR) are included in the logistic regression model, together with a proxy for growth opportunities, the industry-adjusted price-earnings ratio (RPER), and firm size measured by market value (MVAL). If the disciplinary hypothesis holds, then bidders should outperform targets and so all the independent variables in the logistic regression are required to take a positive sign. The logistic results are presented in Tables 7.2 and 7.3.

For the period 1980-85, all the independent variables take the expected sign, except the asset utilisation factor, FTAE, (which is not significant and, according to the partial correlation coefficient *R*, contributes nothing to the discriminatory power of the model). Although the proxy for growth, RPER, takes the correct sign, it is not significant and again contributes nothing to the model's explanatory power. The positive sign and statistical significance of the remaining

² See Norusis (1985: 129) for discussion of interpretation of KMO and the Bartlett test of sphericity.

profitability variables, (FROS, FROC), suggest that bidders did indeed have better performances than targets for the three year pre-bid period, in terms of both return on sales and on capital. The FGEAR shows that bidders were more highly geared. This, following Jensen (1986a), could be interpreted as a sign that bidding management teams were more willing to subject themselves to the discipline of debt, although both groups have gearing levels below the industry norms, which would suggest otherwise. Consistent with earlier results reported above, and with previous studies (e.g. Singh, 1975; Levine and Aaronovitch; 1981), the strongest discriminator is size, MVAL. Nevertheless, the other variables each have an *R* statistic that demonstrates a measurable impact on the discrimination power of the model.

Table 7.2

Logistic Regression to Classify Targets and Bidders by Industry-Standardised Accounting Data Factors and Variables. Sample Period 1980-85.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.2919	0.1235	5.5879	0.0181	0.0825	1.3390
FROC	0.3232	0.1411	5.2421	0.0220	0.0784	1.3815
FTAE	-0.1351	0.1133	1.4204	0.2333	0.0000	0.8737
FGEAR	0.2501	0.1188	4.4338	0.0352	0.0680	1.2841
RPER	0.2732	0.2150	1.6142	0.2039	0.0000	1.3141
MVAL	1.3187	0.2568	26.3764	0.0000	0.2151	3.7386
Constant	-0.8816	0.2653	11.0399	0.0009		

McFadden's $R^2 = 0.1490$

Likelihood Ratio = 78.516 [6], p-value = 0.0000

The diagnostic statistics also suggest a valid model. The McFadden's R^2 of almost 15 per cent is reasonable when compared with the usual values obtained for adjusted R^2 in cross-section multiple regressions in the M&A field, (for example, Sudarsanam *et al*, 1996). The *Likelihood Ratio* statistic (analogous to the *F*-test in multiple regression) is also highly significant and confirms that at least one variable in the model has explanatory power. These diagnostics are also supported by the classification matrix, presented in Table 7.3.

Table 7.3

Classification Table for Targets and Bidders in Sample Period 1980-85 based on Logistic Regression in Table 7.1

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	174	16	91.58
Bidders	86	104	54.74
		Overall	73.16

The overall classification rate of 73.16 per cent implies that the model has a reasonable level of discriminatory power, outperforming random assignment by a comfortable margin and close to the improvement criterion of 25 per cent suggested by Hair *et al.* (1987: 91). However, this is offset by the poor classification for bidders and suggests that the discriminatory power is rather more modest, with a considerable degree of overlap in the target and bidder distributions. Nevertheless, on balance it seems reasonable to infer from the accounting data that bidders, on average, are likely to have had better pre-bid performance than targets in the 1980-85 period. This result is consistent with the share price results reported in Chapter 6 and with the disciplinary hypothesis.

2.2 The Pre-bid Performances of Targets vs Bidders 1986-90

The same investigatory procedures were followed for the 1986-90 sample, starting with a univariate exploration of the accounting, presented in Table 7.4.

In the 1986-90 sample, targets outperformed bidders for all but one accounting performance measures over the 3-years prior to a bid announcement. However, the differences in means are only statistically significant for five variables. For the most part, on average, both bidders and targets have better performances than industry norms. Of particular note is the return on equity measures (RROE) and the deterioration of this measure for targets in the final year prior to bid. This might be connected with a reduction in the mean financial gearing for targets in that year. At the same time, bidders, on average, increased their gearing from below to above industry

norms and, perhaps as a result, improved their return on equity marginally. There appears to be sufficient interest in these results to make the multivariate stage of the analysis worthwhile.

Table 7.4

Univariate Group Differences between Bidders and Targets based on Industry-Standardised Accounting Variables over 3-year Period Prior to Bid Announcement and for Year Prior to Announcement for Period 1986-90.

Variable	3-year Mean			1-year Pre-bid		
	Bidders	Targets	Difference	Bidders	Targets	Difference
RROE	1.0204	0.9598	0.0605	1.0277	0.8738	0.1539 ^a
RROC	0.9985	1.0811	0.0826 ^c	1.0132	1.0397	0.0266
RTPM	0.9970	1.1090	0.1120 ^c	1.0089	1.0311	0.0222
ROPM	1.0287	1.1710	0.1423 ^c	1.0130	1.0760	0.0630
RNPM	1.0064	1.1043	0.0979	1.0244	1.0390	0.0146
RCFM	1.0136	1.0772	0.0636	1.0027	1.0452	0.0425
RTAE	1.0133	1.0887	0.0754	0.9798	1.0808	0.1010 ^c
RGEAR	0.9187	0.7882	0.1305 ^c	1.0131	0.7472	0.2660 ^a

^a significant at 1 per cent level ^b significant at 5 per cent level ^c significant at 10 per cent level

The diagnostic statistics suggest that the factor analysis is a valid procedure. The KMO measure is 0.7632, with a Bartlett statistic of 1,6063.55, (p -value = 0.0000). The four factors identified accounted for 86.5 per cent of the variance in the accounting variables.

The logistic regression results for the sub-period 1986-90 are presented in Tables 7.5 and 7.6.

For the 1986-90 sample, four out of six explanatory variables take a sign inconsistent with the MDH, with only the gearing and size variables taking the correct sign. Targets outperformed bidders for four performance measures, although only the coefficients on FROS and the growth proxy (RPER) are statistically significant. Once again size is the major discriminator.

Table 7.5

Logistic Regression to Classify Targets and Bidders by Industry-Standardised Accounting Data Factors and Variables. Sample Period 1986-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.1559	0.0853	3.3386	0.0677	-0.0362	0.8557
FROC	-0.0140	0.0814	0.0297	0.8632	0.0000	0.9861
FTAE	-0.1311	0.0859	2.3299	0.1269	-0.0180	0.8771
FGEAR	0.1449	0.0904	2.5703	0.1089	0.0236	1.1559
RPER	-0.3647	0.1463	6.2145	0.0127	-0.0642	0.6944
MVAL	0.6912	0.1162	35.3897	0.0000	0.1807	1.9961
Constant	-0.0685	0.1809	0.1432	0.7051		

McFadden's $R^2 = 0.1049$

Likelihood Ratio = 107.274 [6] p-value = 0.0000

The diagnostic statistics suggest that the model has some explanatory power, with a McFadden's R^2 of just over 10 per cent and an *Likelihood Ratio* statistic of 107.274, which is highly significant. However, the classification matrix in Table 7.6 suggests a large degree of overlap in the distributions for targets and bidders. The logistic regression performs well as a classificatory mechanism for targets, but the classification rate of only 50 per cent for bidders is no better than random assignment. Therefore, the extent to which targets outperform bidders is difficult to gauge. An overall classification rate of 69 per cent is also not very close to the 25 per cent improvement criterion, suggested by Hair *et al.*

Table 7.6

Classification Table for Targets and Bidders in Sample Period 1980-85 based on Logistic Regression in Table 7.5

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	322	47	87.26
Bidders	184	185	50.14
		Overall	68.7

Despite its obvious shortcomings, the model does at least show clearly that bidders did not outperform the targets, as required by the disciplinary hypothesis. Indeed, on balance, this evidence suggests that targets are likely to have had slightly better pre-bid performance than bidders. The results are consistent with the share price evidence for 1986-90 presented in Chapter 6 and with managerial objectives.

3. COMPARING ACQUISITION STRATEGIES IN 1980-85 & 1986-90

The consistency of the accounting and event study results lend clear support to the hypothesis that the management motivation for M&A activity varies over time. In the period 1980-85 bidders had superior pre-bid performance compared with targets, and both share price and accounting data are consistent with a disciplinary motivation. In contrast, in the period 1986-90 the reverse seems to have been the case. If anything targets were outperforming bidders prior to the launch of a bid, with the event study results suggesting that, on average, acquisitions represented negative NPV projects for bidders. This could be taken to infer that the management teams of acquirers were pursuing non-maximising objectives, such as growth, as suggested by managerial theories of the firm, (Baumol, 1967; Marris, 1964).

If these inferences about management strategies are correct, then an interesting question presents itself: are there any obvious differences in the financial performances of bidders in the two periods, and/or between the performances of their respective targets? Evidence of the existence of such differences might provide corroborative evidence that different acquisition strategies were at play and might offer some useful insights into the period-contingent nature of M&A strategies. These issues are examined below.

3.1 Comparison of Targets in 1980-85 & 1986-90

A direct comparison of the financial characteristics of targets in the two periods should reflect the results above. During 1980-85, the evidence suggests clearly that targets were subjected to the discipline of the market for corporate control because of poor performance, both relative to bidders and to industry norms. In contrast, targets in the period 1986-90 were not obviously

underperforming either their subsequent acquirers nor their respective industries. Indeed the evidence suggests that, on average, they might well have been the victims of expansionist, managerialist strategies of bidding firms. This leads to a question: is it possible to discriminate between the two target groups?

The results of the first stage in the analysis, the univariate difference in means tests, are set out in Table 7.7.

Table 7.7

Univariate Group Differences between Targets (1980-85) and Targets (1986-90) for Industry-Standardised Accounting Variables over 3-year Period Prior to Bid Announcement and for Year Prior to Announcement.

Variable	3-year Mean			1-year Pre-bid		
	1980-85	1986-90	Difference	1980-85	1986-90	Difference
RROE	0.8135	0.9598	0.1463 ^b	0.7615	0.8738	0.1123 ^c
RROC	0.9416	1.0811	0.1395 ^a	0.9152	1.0397	0.1245 ^a
RTPM	0.9438	1.1090	0.1653 ^a	0.8977	1.0311	0.1334 ^b
ROPM	0.9352	1.1710	0.2358 ^a	0.9061	1.0760	0.1699 ^b
RNPM	0.8250	1.1043	0.2793 ^a	0.7571	1.0390	0.2819 ^a
RCFM	0.9378	1.0772	0.1394 ^b	0.8990	1.0452	0.1463 ^b
RTAE	1.0603	1.0887	0.0284	1.0665	1.0808	0.0143
RGEAR	0.8865	0.7882	0.0982	0.7607	0.7472	0.0135

^a significant at 1 per cent level ^b significant at 5 per cent level ^c significant at 10 per cent level

On average, it is clear that targets in 1986-90 outperformed their counterparts from the 1980-85 period against all financial measures, with statistically significant differences in twelve out of fourteen cases. It seems, therefore, appropriate to examine the differences between the two groups in a multivariate setting.

The factor analysis for the target groups resulted in the same four factors as those obtained when comparing bidders with targets. The diagnostic statistics suggested that factor analysis is a valid procedure. The KMO statistic is 0.7409, well within the acceptable range for sampling adequacy,

and the Bartlett test statistic is 11,943.646 (p -value = 0.0000). The four factors together explained 81.7 per cent of the total variance of the set of accounting variables.

In the first instance the four factors, plus the industry-standardised P-E ratio and firm size were entered in the logistic regression, following the procedure used for bidders versus targets. However, the factors FTAE and FGEAR, and also the variable MVAL all had R statistic values of zero and were subsequently removed. Other variables such as the market-to-book ratio were then entered in a stepwise, *ad hoc* fashion until the model with the best discriminatory power was achieved. The final set of variables in the model were return on capital, return on sales, market-to-book ratio, and P-E ratio. The results are presented in Table 7.8.

Table 7.8

Logistic Regression to Classify Targets (1980-85) and Targets (1986-90) by Industry-Standardised Accounting Data Factors and Variables.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.2659	0.1168	5.1794	0.0229	-0.0668	0.7665
FROC	-0.2305	0.1253	3.3822	0.0659	0.0440	0.7407
RMTB	-0.9322	0.1340	48.4190	0.0000	-0.2553	0.3937
RPER	-0.3939	0.1933	4.1542	0.0415	-0.0550	0.6744
Constant	1.1974	0.2906	16.9717	0.0000		

McFadden's $R^2 = 0.1280$

Likelihood Ratio = 91.187 [4] p -value = 0.0000

In the multivariate analytical framework of the logistic regression model, targets in the period 1986-90 clearly outperformed targets in the earlier period³. An interesting feature of this model, perhaps, is the impact of the industry standardised market-to-book ratio, which did not figure at all in attempts to discriminate between bidders and targets. The explanatory power of the RMTB variable is consistent with an earlier UK study of targets and potential targets, (Powell and Thomas, 1994).

³ The targets for 1980-85 were coded 1 and those for 1986-90 coded 0, so that a negative coefficient should be interpreted as favouring targets in the latter sample.

Both diagnostic statistics are at acceptable levels, suggesting that the model has explanatory power and this is confirmed by the classification matrix (Table 7.9).

Table 7.9

Classification Table for Targets (1980-85) versus Targets (1986-90) based on Logistic Regression in Table 7.8

Observed	Predicted		Percent Correct
	Targets 80-85	Targets 86-90	
Targets 80-85	114	76	59.99
Targets 86-90	38	331	89.71
		Overall	79.04

The overall classification rate of 79 per cent is in excess of the improvement criterion suggested by Hair *et al.*, although the classification rate for targets in 1980-85 only reaches 60 per cent. Nevertheless, a reasonable inference to draw from these results would be that there seems to be a clear distinction between the pre-bid performance of targets in the two periods.

This evidence simply serves to confirm the earlier results with accounting data, which showed that targets in the first period were significant underperformers, whereas those in the second were not. On average, targets during 1986-90 did not underperform industry norms, and also had marginally better performance than the bidders that acquired them. Indeed the market for corporate control reflected this and, as a result, acquirers had to pay larger premiums to acquire control in the second period than acquirers in the first period. When measured over the full announcement-completion interval, targets abnormal returns in 1986-90 were on average 5.05 per cent higher than in 1980-85, a difference that is statistically significant ($t = 5.36, p = 0.0000$).

3.2 Comparison of Bidders in 1980-85 & in 1986-90

Unlike target groups, in the case of bidders there does not appear to be any obvious reason why one group should have a better pre-bid financial performance than the other. But, given that the event study and accounting results for bidders in the 1980-85 sample are consistent with the

MDH, whilst those for bidders in the 1986-90 sample are not, it would seem worthwhile to compare the financial performances of the two groups. However, whilst the MDH requires that (as a minimum) bidders have superior pre-bid performance relative to targets, it does not follow that bidders applying the discipline of the market would necessarily have better pre-bid performance than bidders driven by managerial motives. Indeed, good performance might well fuel strategies of managerial expansion on the part of bidders, (Roll, 1986).

Once again the first step involves a univariate analysis of accounting variables and the results of this are presented in Table 7.10.

Table 7.10

Univariate Group Differences between Bidders (1980-85) and Bidders (1986-90) for Industry-Standardised Accounting Variables over 3-year Period Prior to Bid Announcement and for Year Prior to Announcement.

Variable	3-year Mean			1-year Pre-bid		
	1980-85	1986-90	Difference	1980-85	1986-90	Difference
RROE	1.1646	1.0204	0.1442 ^b	1.1223	1.0277	0.0946
RROC	1.0889	0.9985	0.0904	1.0652	1.0132	0.0520
RTPM	1.1792	0.9970	0.1822 ^b	1.1927	1.0089	0.1838 ^b
ROPM	1.1914	1.0287	0.1627 ^c	1.1268	1.0130	0.1138
RNPM	1.2200	1.0064	0.2136 ^c	1.2233	1.0244	0.1988 ^c
RCFM	1.1727	1.0136	0.1591 ^c	1.1910	1.0027	0.1882 ^a
RTAE	1.0082	1.0133	0.0051	0.9564	0.9798	0.0234
RGEAR	0.9699	0.9187	0.0512	1.0218	1.0131	0.0086

^a significant at 1 per cent level ^b significant at 5 per cent level ^c significant at 10 per cent level

For both the 3-year and 1-year versions of the variables, bidders in the 1980-85 sample have a better profitability profile than those in the later period. This is certainly consistent with the results presented above and suggests that further investigation is warranted.

Once again the accounting data was subjected to factor analysis, which produced only three

composite factors or variables - return on revenues (FROS), return on capital (FROC), and gearing (FGEAR). These variables, along with the P-E ratio and the size variable were then included in the first logistic model to be tested. As with the target groups the gearing and size variables contributed nothing to the model and so were eliminated. Other variables, were subsequently added in a stepwise, *ad hoc* procedure, but only the market-to-book ratio was found to contribute to the discriminatory power of the model. The final model and results are presented in Table 7.11.

Table 7.11

Logistic Regression to Classify Bidders (1980-85) and Bidders (1986-90) by Industry-Standardised Accounting Data Factors and Variables.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.2210	0.0943	5.4972	0.0190	0.0699	1.2473
FROC	0.3255	0.1074	9.1769	0.0025	0.1001	1.3847
RPER	-0.2516	0.0700	12.9065	0.0003	-0.1234	0.7776
RMTB	0.2983	0.1639	3.3125	0.0688	0.0428	1.3476
Constant	-0.5509	0.2138	6.6390	0.0100		

McFadden's $R^2 = 0.0423$
Likelihood Ratio = 30.302 [4] p-value = 0.0000

The coefficient estimates for the four explanatory variables were all statistically significant. The FROS, FROC, and RMTB variables were positive suggesting that bidders in the 1980-85 sample had better pre-bid profitability than those in the second period, but the latter appear to have had better growth prospects as indicated by the negative sign taken by the industry-standardised P-E ratio.

Despite the statistical significance of the estimated coefficients, the McFadden's R^2 is rather low at 0.0423, as is Likelihood Ratio although it is still highly significant. However, the classification matrix (Table 7.12) suggests that little reliance can be placed on the discriminatory power of the model. Whilst the allocation of bidders in the 1980-85 sample is extremely good, this is offset by the extremely poor classification of 1986-90 bidders. Clearly there is a very large multivariate

overlap in the performance distributions of the two groups, which was not manifested in the univariate analysis. Taken together there appears to be some *prima facie* evidence that 1980-85 bidders had marginally better pre-bid performance, but the difference is clearly insufficient to discriminate between the two groups in any meaningful way.

Table 7.12

Classification Table for Bidders (1980-85) versus Bidders (1986-90)
based on Logistic Regression in Table 7.11.

Observed	Predicted		Percent Correct
	Bidders 80-85	Bidders 86-90	
Bidders 80-85	15	354	95.93
Bidders 86-90	172	18	9.47
		Overall	66.55

On the basis of these results, it would appear that the comparison of pre-bid financial characteristics for the two bidder groups offers little clue as to why their acquisitions strategies should have diverged. Of course, the lack of difference between the characteristics of the two groups could simply point to the crucial importance of *timing* in the decision to expand via acquisition.

In a capital budgeting context, a rising market lowers the implicit cost of capital and encourages investment (including acquisition), but at the same time the relative price of assets in place (acquisition) *versus* new investment rises, making successful acquisition more problematic. Furthermore, after a period when most acquisitions have been driven by the disciplinary motive, then *ceteris paribus* there will be fewer targets exhibiting an obvious lack of management competence. Therefore target choice is likely to be more difficult, as is the potential to extract post-acquisition improvements in the performance of the chosen target. And finally, in expansionary periods there might well be an increase in hubris on the part of potential bidders, (Roll, 1986).

4. THE IMPACT OF RELATEDNESS DURING 1980-85 & 1986-90

The impact of industry relatedness on shareholder wealth was investigated in previous chapters. Taken as a whole, the accounting and share price results for 1980-90 provide little support for the relatedness hypothesis. The share price data for 1980-85 and 1986-90 reported in Chapter 6, presented a mixed picture. The relatedness hypothesis seems to have held in 1980-85, but not in 1986-90. The purpose of this section is to re-examine the issue for these two sub-samples with accounting data.

4.1 Relatedness and Pre-bid Performance of Bidders & Targets

The evidence from Tables 7.1 through 7.6 shows that, ignoring the issue of relatedness, bidders out-performed targets in 1980-85, whilst targets performed marginally better than bidders in the 1986-90 period. The inference drawn was that disciplinary motives were likely to have been important in the earlier period, but that managerial objectives were likely to have been more important in the later period. In this section the sample is grouped into related and unrelated acquisitions and the pre-bid performances of targets *versus* bidders are re-examined.

The first set of results, comparing the pre-bid performances of bidders and targets involved in related transactions during 1980-85 are presented in Tables 7.13 and 7.14. Once again factor analysis and logistic regression techniques are used to discriminate between the performances of the two groups.

The diagnostics for the factor analysis suggest a valid procedure. It accounted for 88.3 per cent of the total variance of the standardised accounting variables used; the KMO statistic of 0.7311 passed the usual sampling adequacy threshold; and the Bartlett test was highly significant against the null that the correlation matrix for the accounting variables was an identity matrix.

Each variable in the logistic model takes the expected sign and demonstrates that related bidders outperformed targets; a result that is consistent with the share price results reported in Chapter 6. Although, not all the coefficient estimates are statistically significant, it seems possible to discriminate between related bidders and targets in respect of return on revenue, FROS, the

growth proxy, RPER, and size, MVAL.

Table 7.13

Logistic Regression to Classify Targets and Bidders in Related Acquisitions by Industry-Standardised Accounting Data Factors and Variables. Sample 1980-85.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.6728	0.3701	3.3058	0.0690	0.0782	0.0782
FROC	0.3452	0.2421	2.0334	0.1539	0.0125	0.0125
FTAE	0.0051	0.2053	0.0006	0.9801	0.0000	0.0000
FGEAR	0.2631	0.2114	1.5494	0.2132	0.0000	0.0000
RPER	0.5562	0.3257	2.9164	0.0877	0.0655	0.0655
MVAL	1.4692	0.4318	11.5763	0.0007	0.2118	0.2118
Constant	-1.2100	0.4261	8.0653	0.0045		

McFadden's $R^2 = 0.1910$

Likelihood Ratio = 41.620 [6] p-value = 0.0000

Table 7.14

Classification Table for Targets and Bidders in Related Acquisitions for Sample 1980-85, based on Logistic Regression in Table 7.13

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	70	7	90.91
Bidders	31	46	59.74
		Overall	75.32

The diagnostics for the model are also healthy, with a McFadden's R^2 of 19 per cent (the highest level for any of the logistic regressions presented so far) and a significant Likelihood Ratio statistic. Furthermore, the classification matrix in Table 7.13 shows that the model meets the additional discriminatory premium, (25 per cent better than random assignment), suggested by Hair *et al.* (1987:91).

These results are broadly consistent with earlier UK studies with accounting data. On a univariate basis Singh (1971, 1975), Meeks (1977), Levine and Aaronovitch (1981) all report size as the dominant discriminator and some modest support for bidders having superior pre-bid performance. However, in a multivariate context they were unable to discriminate convincingly between the two groups. This suggests that adding the additional filter of relatedness might improve discrimination.⁴

Table 7.15

Logistic Regression to Classify Targets and Bidders in Unrelated Acquisitions by Industry-Standardised Accounting Data Factors and Variables. Sample 1980-85.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	0.2092	0.1575	1.7644	0.1841	0.0000	1.2327
FROC	-0.0221	0.1474	0.0226	0.8806	0.0000	0.9781
FGEAR	0.2145	0.1477	2.1095	0.1464	0.0187	1.2393
RPER	-0.0916	0.3047	0.0904	0.7637	0.0000	0.9125
MVAL	1.3021	0.3195	16.6130	0.0000	0.2160	3.6771
Constant	-0.5207	0.3496	2.2180	0.1364		

McFadden's $R^2 = 0.1263$

Likelihood Ratio = 39.566 [5] p-value = 0.0000

In the case of unrelated acquisitions, the results in Tables 7.15 and 7.16 show that bidders did not exhibit a pre-bid performance that is clearly superior to that of targets. For unrelated acquisitions the factor analysis only produced three factors, (FROS, FROC, FGEAR). Although the diagnostics suggest that these produce a reasonable representation of the accounting data⁵, in the subsequent logistic regression only size proved to be a significant discriminator between targets and bidders, with a negative sign on FROC and RPER suggesting that targets had both a better return on capital and better growth opportunities.

⁴ None of these other studies accounted for the degree of relatedness.

⁵ The factor analysis explained 84.5 per cent of the total variance in the accounting data; the KMO statistic was 0.78404 and passed the usual sample adequacy threshold; and the Bartlett statistic of 5,157.2087 was highly significant (p-value = 0.0000).

These results are not consistent with those for related acquisitions, nor with earlier accounting studies (Singh, 1971, 1975; Meeks, 1977; Levine and Aaronovitch, 1981), which show (albeit on a univariate basis) that bidders marginally outperform targets in the pre-bid period.

While the diagnostics suggest that the model has explanatory power, and the classification rate of 71.68 per cent was close to the Hair *et al.* improvement threshold (Table 7.16) the allocation of bidders was little better than that expected by random assignment. From these results it is clear that bidders did not have superior performance over unrelated targets in the 1980-85 period, a result that is again consistent with the share price results reported in Chapter 6. where unrelated bidders suffered significant losses.

Table 7.16
Classification Table for Targets and Bidders in Unrelated Acquisitions
for Sample 1980-85, based on Logistic Regression in Table 7.15

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	103	10	91.15
Bidders	54	59	52.21
		Overall	71.68

For period 1980-85 then, the relatedness of acquisitions appears to provide some explanation of the difference in share price returns to bidders, and also confirms that related acquisitions were consistent with disciplinary motives. These findings are supported by the accounting data.

Turning to the period 1986-90, the factor analysis for related bidders and targets produced the usual four factors, FROS, FROC, FTAE, and FGEAR. The diagnostics suggested that this was a valid procedure: the sampling adequacy measure, KMO is 73.944; the Bartlett statistic is 8109.0122, ($p = 0.0000$); and the procedure accounted for 88.3 per cent of the total variance in the set of accounting variables. These factors were incorporated in a logistic regression model and the results are set out in Table 7.17.

Table 7.17

Logistic Regression to Classify Targets and Bidders in Related Acquisitions by Industry-Standardised Accounting Data Factors and Variables. Sample 1986-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.1123	0.1259	0.7955	0.3724	0.0000	0.8938
FROC	0.0855	0.1249	0.4687	0.4936	0.0000	1.0893
FTAE	-0.0074	0.1184	0.0039	0.9500	0.0000	0.9926
FGEAR	0.1779	0.1498	1.4108	0.2349	0.0000	1.1947
RPER	-0.3931	0.2317	2.8778	0.0898	-0.0449	0.6750
MVAL	0.9640	0.2209	19.0439	0.0000	0.1979	2.6221
Constant	-0.1743	0.2860	0.3715	0.5422		

McFadden's $R^2 = 0.1358$

Likelihood Ratio = 59.134 [6] p-value = 0.0000

The diagnostics suggest that the model has explanatory power, but the signs on the variables are inconsistent, with only two variables, RPER and MVAL, achieving statistical significance and contributing to explanatory power. These results are consistent with the weak multivariate results achieved in earlier UK studies, (Singh, 1975; Levine and Aaronovitch, 1981).

Table 7.18

Classification Table for Targets and Bidders in Related Acquisitions for Sample 1986-90, based on Logistic Regression in Table 7.17

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	139	18	88.54
Bidders	76	81	51.59
		Overall	70.06

The lack of discriminatory power in the model is confirmed by the classification matrix in Table 7.18, which shows that the allocation of the bidder group is little better than that expected by random assignment.

The evidence of Tables 7.17 and 7.18 show that related bidders did not exhibit clear pre-bid

superiority during 1986-90. Indeed the sign and significance of the coefficient on the growth proxy suggests that the targets might have had better growth prospects. These results are consistent with the share price returns reported in Chapter 6, which showed that statistically significant losses to related acquirers during this period averaged over 4 per cent.

The results for the unrelated cases are presented in Tables 7.19 and 7.20. The three performance factors, FROS, FROC, and RPER all take a negative sign, although only the latter two are statistically significant and have meaningful R-statistics. The positive signs on firm size and gearing confirm that bidders are larger and more highly geared than targets, and the R-statistic for firm size shows that it is, again, the major discriminator. The results demonstrate that during 1986-90 unrelated targets, on average, had slightly better pre-bid performance than the firms that subsequently acquired them. This result is inconsistent with the disciplinary hypothesis and also with univariate results reported in earlier studies, (Singh, 1971, 1975; Meeks, 1977; Levine and Aaronovitch, 1981) .

Table 7.19

Logistic Regression to Classify Targets and Bidders in Unrelated Acquisitions by Industry-Standardised Accounting Data Factors and Variables. Sample 1986-90.

Variable	β_i	SE(β_i)	Wald	p-value	R	Exp(β_i)
FROS	-0.1122	0.1081	1.0772	0.2993	0.0000	0.8939
FROC	-0.2085	0.1071	3.7918	0.0515	-0.0553	0.8118
FGEAR	0.2182	0.1249	3.0500	0.0807	0.0424	1.2438
RPER	-0.3724	0.1900	3.8411	0.0500	-0.0561	0.6891
MVAL	0.5546	0.1342	17.0750	0.0000	0.1605	1.7412
Constant	0.0188	0.2363	0.0063	0.9366		

McFadden's $R^2 = 0.0904$

Likelihood Ratio = 52.913 [5] p-value = 0.0000

The diagnostics of the logistic regression (Table 7.20) suggest a valid model, but the classification matrix demonstrates only modest discriminatory power. Nevertheless, in showing that targets have marginally better pre-bid performance than bidders, the accounting data is in

line with the share price results reported in Chapter 6, which showed statistically significant losses to unrelated bidders in the order of 3.7 per cent.

Table 7.20

Classification Table for Targets and Bidders in Unrelated Acquisitions for Sample 1986-90, based on Logistic Regression in Table 7.19

Observed	Predicted		Percent Correct
	Targets	Bidders	
Targets	177	34	83.89
Bidders	103	108	51.18
		Overall	67.54

The accounting data broadly support the findings about the relatedness hypothesis that were obtained with share price data. Related bidders during 1980-85 made approximately zero abnormal returns and had clearly superior performance in the 3 years prior to a bid. Unrelated bidders suffered losses and had pre-bid performance that was at best comparable to targets. In the 1986-90 period the relatedness hypothesis was not supported by either the accounting data or the share price data. The substantial losses suffered by bidders in this period suggest that any relatedness effect was likely to have been swamped by the managerial objectives to achieve rapid growth.

5. SUMMARY AND CONCLUDING REMARKS

The accounting results set out in Tables 7.1 through 7.6 are in line with the share price results for bidders reported in Chapter 6. In the period 1980-85 acquiring firms have superior profitability compared to targets for the three years prior to the initiation of a bid. Recall from Tables 6.2 and 6.3 that on an equally-weighted basis the mean return to 1980-85 bidders was an insignificant loss of less than one per cent, and on a value-weighted basis an insignificant gain of around one per cent. Taken together, the accounting and share price results are consistent with the disciplinary hypothesis. During this period the management teams of acquiring firms appear

to have held disciplinary motives for their acquisition strategies.

In contrast, the results for the sub-period 1986-90, suggest the reverse. Although the logistic regression does not discriminate very well between targets and bidders, it does provide weak evidence that target performance is slightly better than that of bidders. These results are in line with the substantial and statistically significant wealth losses to acquiring firms, on both equally- and value-weighted bases, (Tables 6.5 and 6.6). Taken together, the accounting and event study results provide a clear picture, inconsistent with the tenets of the disciplinary hypothesis. They also suggest that during the 1986-90 period bidders are more likely to have held managerial motivations in respect of the acquisitions that they undertook.

When the target groups are compared, the data shows that targets in 1986-90 had better performance than those from the 1980-85 period. From the univariate data in Table 7.7 it is clear that targets' performance in the earlier period was consistently below industry averages, whereas 1986-90 targets' performance was comparable with or slightly better than industry averages, (except for return on equity variable). The multivariate results (Tables 7.8 and 7.9) only serve to highlight the difference between the two groups of targets. The target-to-target comparisons also serve to support the share price results reported in Chapter 6. The fact that targets in 1980-85 were weak is reflected in the positive results for bidders, and the relative strength of targets in 1986-90 probably accounts for the losses to bidders in that period.⁶

Comparisons of the two bidders groups revealed little. Whilst those in the 1986-90 period did not have as good a level of performance as bidders in 1980-85, they do appear, on average, to have performed slightly better than industry norms. This better than average performance in 1986-90 might well have lead management teams to suffer from hubris (Roll, 1986) and over-value their targets.⁷ Furthermore, their choice of targets did not have an obvious disciplinary

⁶ During 1986-90 bidders paid much larger premiums than bidders in 1980-85, which probably reflects the strength of targets. When standardised by the market value of targets premiums were 3.4 times higher in 1986-90, while on average the market value of targets was only 2 times higher. The difference between the values of the standardised premiums for the two periods is statistically significant at the one per cent level, ($t = 2.71$).

⁷ Given that industrial and commercial investment responds broadly in a cyclical fashion with respect to economic conditions, it seems likely that management expectations or optimism, which underpin that investment behaviour,

rationale and certainly did not meet with the approval of the market for corporate control.

For the 1980-85 period, the use of accounting data and classification by relatedness clearly help to illuminate the event study results. Related bidders had better pre-bid performance than the targets they subsequently acquired and made modest, though statistically insignificant gains for their shareholders. Bidders who acquired unrelated targets, on the other hand, did not have identifiably superior pre-bid performance and, perhaps as a result, suffered small losses in market value. The event study and accounting results are consistent with and support both the disciplinary hypothesis and the relatedness hypothesis.

Classification by relatedness offers little by way of illumination for 1986-90. Both related and unrelated bidders suffered statistically significant wealth losses of around 4 per cent on an equally-weighted basis. However, the accounting data shows clearly that neither group of bidders exhibited pre-bid superiority relative to targets. It could be, therefore, that the potential benefits of relatedness can be overwhelmed if bidders are unable to demonstrate superior management performance relative to the targets chosen, and if they pay too much to acquire control.

The results from this chapter support the event study results in Chapter 6. It has been shown that support for the relatedness hypothesis, as well as the disciplinary hypothesis can be influenced substantially by the date of acquisition. The results presented here would appear to go some way towards explaining the inconsistency of the results from previous studies that have examined these issues.

are similarly conditioned by economic conditions. Therefore it seems reasonable to think that manifestations of hubris might similarly wax and wane in a similar fashion.

CHAPTER 8

Summary and Policy Implications

1. INTRODUCTION

This study has had four main objectives. First, to re-examine the theoretical basis of the market for corporate control, in particular the management displacement hypothesis which characterises the market as an effective discipline over corporate management teams. This disciplinary hypothesis has played a crucial role in the development and register of recent competition policy in the UK and the US,¹ and has been the lens through which empirical evidence has been interpreted.² Second, to re-examine the relatedness issue. Modern portfolio theory suggests that unrelated mergers will not be valued by the market, but the extant empirical research has not produced unequivocal support for this proposition. Third, to investigate the impact that calendar time and the changes in economic climate have on the strategic motives for mergers and acquisitions. Fourth, to reconcile the disparate conclusions that have emanated from findings generated by two empirical traditions - financial and industrial economics. This was done by using a combination of share price and accounting data and a combination of research methodologies and methods.

The first two aims have been the basis of a number of previous studies, and to a certain extent this part of the work represents a replication of that earlier work. However, an original contribution is made to the extent that daily rather than monthly share price data has been used,

¹ See, for example, Fairburn (1989) and Hay (1989).

² For example, Jensen and Ruback (1983) with US evidence and Franks and Harris (1989) with UK evidence.

which has the advantage that narrow event windows were employed. This is more in keeping with the technical requirements of the event study methodology. Furthermore, a re-examination of these issues was a necessary prerequisite for the empirical work on the final two aims - investigation of the effects of calendar time and reconciliation of share price and accounting studies.

Earlier work has drawn attention to variations in results obtained for different time periods, but none has studied this phenomenon in a systematic way. For example, Dickerson *et al.* (1997) report variations in results obtained with accounting data for different time periods, but offer no analysis to account for these differences. In the case of share price data, Limmack (1990) notes considerable differences in the announcement returns to bidders and targets for the periods 1977-80 and 1981-86, but offers little explanation, other than unsubstantiated comments about changes in regulatory regime and economic climate. Similarly, Sudarsanam *et al.* (1996) report instability in their results over time, but offer no explanation, remarking that '... the temporal sensitivity of shareholder returns ... needs further investigation', Sudarsanam *et al.* (1996: 692). Finally, focusing on post-merger returns, Higson and Elliott (1998) point to both qualitatively and quantitatively different results for a 1975-90 sample and for mergers consummated during the 1981-84 window. They point out that the variation in results over time has also been reported in the US and suggest that the issue is 'intriguing and merits further research', but offer little further explanation, beyond reference to changing stock market conditions.

The factors mentioned by Limmack (1990) might well have played a role in determining differences in individual merger outcomes over time, but they did not have much impact on aggregate M&A activity for the two sub-periods that he examined, (CSO, 1993). Similarly, the breaks identified by Higson and Elliott (1998) in their 1975-90 sample, do not line up with the aggregate M&A cycle, although their brief comment about stock market conditions are clearly related. This is in contrast to the current study where, it has been argued, aggregate M&A activity in combination with the business cycle plays an important role in determining economic returns to successful bidders.

From the results obtained in the present study, it appears that business and merger cycles have

a significant impact on the disciplinary role of the market for corporate control. The share price results demonstrate systematic variation in returns to the shareholders of acquiring firms. In isolation, these can only be interpreted as indirect tests of and evidence about the disciplinary hypothesis. However, when informed by and interpreted in conjunction with results of the analysis with accounting data, they offer a much clearer picture. This suggests that in the UK, mergers and acquisitions can be both a symptom of principal-agent problems and a remedy or discipline that can ease those problems. This conclusion has a clear resonance with the free cash flow theory advanced by Jensen (1986a), based on US data.

The structure of the rest of this chapter is as follows. The next section provides a brief summary and review of the empirical evidence generated in the course of the current study. This shows how the conclusions referred to above were reached. The implications of this evidence and the conclusions drawn from it are then used in the next section to make a contribution to the current public policy debate. They are also used to comment on the development and implementation of business strategies in the corporate domain and the competence of UK strategic management and thinking. The fourth section puts forward a policy proposal which would impose disclosure requirements on bidders and acquiring firms which, it is argued, would improve the efficiency and effectiveness of the market for corporate control. The final section provides a brief summary and some concluding remarks.

2.SUMMARY & REVIEW OF EMPIRICAL RESULTS

In this section the empirical results from Chapters 4 through 7 are collated, summarised and analysed. The analysis begins with the event study results (Chapters 4 and 6), followed by the accounting results (Chapters 5 and 7). Finally, both sets of results are used to examine the questions set at the beginning of the thesis.

2.1 Event Study Results 1980-90

A summary of the event study results is provided in Table 8.1. Here the findings for the full sample period 1980-90 are contrasted with those from the two sub-periods, 1980-85 and 1986-90. The results for targets are non-controversial, namely that they make substantial gains regardless of the type or timing of a merger. Therefore, attention is focussed on the results for

bidders, which is the area of contention in the literature.

Table 8.1

Summary of Cumulated Average Abnormal Returns to Successful Bidders 1980-90 (N=559), 1980-85 (N=190), and 1986-90 (N=369).

Event Window	Equally-weighted			Value-weighted		
	CAAR	+%	t-stat	CAAR	+%	t-stat
<i>Panel A: Pre-bid period (-80,0)</i>						
Bidders 1980-90	1.3%	56 ^a	1.08	-0.1%	56 ^a	0.34
Bidders 1980-85	-0.5%	59 ^b	0.32	nr	nr	nr
Bidders 1986-90	2.2%	54 ^a	1.30	nr	nr	nr
<i>Panel B: Pre-bid to Announcement (-60,1)</i>						
Bidders 1980-90	0.1%	45 ^b	0.52	0.7%	45 ^b	0.88
Bidders 1980-85	0.0%	55	0.07	nr	nr	nr
Bidders 1986-90	-0.3%	47 ^c	1.09	nr	nr	nr
<i>Panel C: Announcement Period (-1,1)</i>						
Bidders 1980-90	-1.8% ^a	35 ^a	6.03	-2.6% ^a	35 ^a	8.67
Bidders 1980-85	-0.9%	46	1.26	1.2%	46	0.81
Bidders 1986-90	-2.03% ^a	29 ^a	7.69	-1.5% ^a	29 ^a	3.00
<i>Panel D: Announcement-Completion (A-C)</i>						
Bidders 1980-90	-3.0% ^a	45 ^b	5.02	-3.9% ^a	45 ^b	6.86
Bidders 1980-85	-0.9%	50	1.10	0.0%	50	0.09
Bidders 1986-90	-3.8% ^a	41 ^a	4.75	-3.8% ^b	41 ^a	2.38
<i>Panel E: Post-completion (0,200) market model</i>						
Bidders 1980-90	-21.1% ^a	36 ^a	7.81	-2.0% ^a	36 ^a	4.00
Bidders 1980-85	-9.3% ^a	38 ^a	2.74	-4.8%	38 ^a	0.94
Bidders 1986-90	-20.8% ^a	35 ^a	7.17	-12.3% ^a	35 ^a	4.24
<i>Panel F: Post-completion (0,200) market-adjusted model abnormal returns</i>						
Bidders 1980-90	-5.3% ^a	42 ^a	3.53	-0.6% ^b	42 ^a	2.01
Bidders 1980-85	1.8%	45	0.95	1.5%	45	0.45
Bidders 1986-90	-9.0% ^a	41 ^a	4.50	-3.5% ^c	41 ^a	1.84

^{a, b, c} statistically significant at 1%, 5%, 10% levels

For the 1980-90 period the results obtained have similarities with those reported in the extant literature, although there are some notable differences. It is likely that at least some of the differences are due to the use of daily share price data in the current study, as opposed to the use of monthly data to be found in previous UK studies. In particular for the narrow event windows drawn around bid announcement (panel C) on average bidders during 1980-90 suffered losses of 1.8 per cent on an equally-weighted basis, rising to 2.6 per cent on a value-weighted basis. Both results are statistically significant at the one per cent level. An examination of the distributions of abnormal returns shows that only 35 per cent of acquiring firms achieved returns of zero or more, again significant at the one per cent level using the non-parametric bi-nomial test. When the event window is extended to cover the full announcement to completion interval (A-C) the average losses rise to 3.0 and 3.9 per cent respectively on an equally- and value-weighted basis. Once again these results are significant at the one per cent level, although the proportion of acquiring firms suffering losses is reduced to 45 per cent by the completion date.

Consistent with these results, some of the previous UK studies have found significant losses for acquiring firms, although the majority have reported abnormal returns insignificantly different from zero. The larger value-weighted losses are consistent with the small number of earlier studies that have reported value-weighted returns, even when zero equally-weighted returns were reported. This suggests that at announcement, the takeover market, on average, tends to take a more pessimistic view of the prospects of larger acquirers than those of smaller acquirers. This could be indicative of more severe principal-agent problems in larger firms, where the dispersion of shareholdings is (probably) greater.

Of course, the announcement period results from the current study are not strictly comparable with previous studies, which have used monthly data. The crucial difference is the width of the event window. The definition and precision of event windows were examined in detail in Chapter 4. Because of the problem of 'event smearing', narrower event windows are to be preferred, and are more consistent with the methodological underpinnings of the event study technique.

However, for completeness and for purposes of comparison, a number of wider event windows were utilised in the current study as well. When the event window is extended to include the pre-

bid period, successful bidders make positive, but statistically insignificant gains, (panel B). This reversal of fortunes is clearly the result of positive abnormal returns recorded for bidders in the pre-bid period, (panel A), even though these gains are also insignificant. Both findings are consistent with some, but by no means all the previous UK studies. Some contributions to the literature argue that these positive pre-bid returns are due to bid anticipation by the market. Even if that is so, dating the leakage of information becomes highly problematic. Researchers have attempted to overcome this by extending the event window for some months pre-bid, but this means strictly that the event study is transformed into an *association* study, a much less powerful testing procedure. Furthermore, positive returns in anticipation of a bid also do not explain the negative response recorded at the time of the formal bid announcement.

Despite the preference for narrower event windows, the current study has also advanced a number of arguments in support of a specific extended window, the announcement to completion (A-C) interval. Although the A-C interval suffers of course from a lack of precision over specific information releases, it is clear that a continuous stream of information will flow during a live bid, and agents will continuously adjust expectations about the likelihood of bid success. This was confirmed by the sign of the share price response at announcement with that at completion for each bidder (Table 4.11). The average abnormal returns for the A-C window (panel D) confirm the negative returns recorded at announcement, and are consistent with the only other UK study to focus on this specific event window, (Limmack, 1991).

In the case of the post-merger event windows, (panel E and F), acquiring firms suffer large, statistically significant negative returns. These results are broadly consistent with the majority of earlier studies,³ including the smaller losses of the acquirers when the adjusted market model benchmark is used. An interesting feature is the reversal of the findings at announcement for both equally- and value-weighted returns. The smaller value-weighted returns suggesting that the market expects poorer post-merger performance from smaller acquirers, once the final terms of the acquisition are known.

³ With the notable exception of Higson and Elliott (1998), although in most years of their sample successful bidders did suffer negative and significant returns.

Table 8.2

Summary of Cumulated Average Abnormal Returns to Bidders involved in Related and Unrelated Acquisitions, 1980-90 (N=559), 1980-85 (N=190), and 1986-90 (N=369).

Event Window	Equally-weighted			Value-weighted		
	CAAR	+%	t-stat	CAAR	+%	t-stat
<i>Panel A: Related Bidders Announcement Period (-1,1)</i>						
Bidders 1980-90	-0.019 ^a	42 ^a	4.75	-0.018 ^a	42 ^a	3.03
Bidders 1980-85	-0.007	57 ^b	1.17	-0.008	57 ^b	1.00
Bidders 1986-90	-0.024 ^a	33 ^a	6.02	-0.017 ^a	33 ^a	2.43
<i>Panel B: Related Bidders Announcement-Completion (-1,C)</i>						
Bidders 1980-90	-0.038 ^a	42 ^a	4.22	-0.018 ^a	42 ^a	2.58
Bidders 1980-85	0.012	51	0.86	0.014	51	1.08
Bidders 1986-90	-0.043 ^a	39 ^a	3.91	-0.056 ^a	39 ^a	3.51
<i>Panel C: Unrelated Bidders Announcement Period (-1,1)</i>						
Bidders 1980-90	-0.017 ^a	32 ^a	4.26	-0.021 ^a	32 ^a	3.33
Bidders 1980-85	-0.010	53	1.43	0.006	53	1.04
Bidders 1986-90	-0.021 ^a	39 ^a	5.25	-0.013 ^c	39 ^a	1.86
<i>Panel D: Unrelated Bidders Announcement-Completion (-1,C)</i>						
Bidders 1980-90	-0.032 ^a	37 ^a	4.03	-0.038 ^a	37 ^a	3.36
Bidders 1980-85	-0.023 ^b	39 ^a	1.92	-0.009	39 ^a	0.53
Bidders 1986-90	-0.037 ^a	35 ^a	3.36	-0.024 ^a	35 ^a	3.03

^{a, b, c} statistically significant at 1%, 5%, 10% levels

Finally, turning to the issue of the impact of relatedness, the results summarised in Table 8.2 suggest little difference in the returns to related and unrelated acquirers for the 1980-90 period. Both groups suffer significant losses at announcement in the order of 2 per cent, rising to over 3 per cent for the longer A-C interval. The value-weighted announcement returns are similar to the equally-weighted returns, although over the longer interval the value-weighted losses to related acquirers are halved. A tentative conclusion would be that these transactions were viewed with rather less misgivings than diversifying mergers, although the losses are still significant at the one per cent level.

Taken as a whole, it appears that mergers and acquisitions over the period 1980-90 represented negative NPV projects for acquiring firms. Furthermore, it would seem that gains to target shareholders in the same period were achieved directly at the expense of the shareholders of acquirers, (see Table 4.14).

2.2 Event Study Results for 1980-85 and 1986-90

Apart from the larger announcement losses to acquiring firms, the results for the period 1980-90 might be regarded as unremarkable. However, when the sample period is bifurcated, the subsequent event study results produce a very different picture.

The statistical modelling literature confirms that aggregate M&A activity is correctly characterised as following a wave-like pattern. Indeed the empirical work by Town (1992) suggests that it might be appropriate to conceptualise the wave pattern as periods of equilibrium and disequilibrium. An examination of the aggregate M&A data for 1980-90 suggests that activity can be divided, approximately, into two halves. The first half, 1980-85 when the level of activity in the market for corporate control was at relatively low levels of activity could be considered the equilibrium phase: the second, 1986-90, when the market was at record levels, as the disequilibrium phase.

Following on from this, the early part of Chapter 6 presented a series of related arguments to suggest that management expectations, risk preferences and decision frameworks were likely to vary systematically with respect to changes in the general economic climate. These variations in turn were assumed to have had a direct impact on management motives for mergers and acquisitions over the 1980-90 M&A cycle. In particular, risk preferences would vary directly with economic activity. Furthermore, reference to the literature on corporate behaviour during phases of the business cycle,⁴ reinforced the hypothesis about asymmetrical responses to changes in economic conditions on the part of management teams. Drawing these diverse strands together, it was hypothesized that acquisitions in the period 1980-85 were driven by opportunities for cost savings, and would thus be more consistent with disciplinary motives. In contrast, with

⁴ For example, Geroski and Gregg (1997).

expansionary conditions in the period 1986-90, acquisitions during this period were more likely due to motives relating to growth and strategic positioning. Furthermore, given the higher demand for acquisitions in the latter period, and the consequently higher premiums that bidders had to pay for control,⁵ it was hypothesised that acquisitions in the first half of the sample would be more profitable than the second. As the summary of results in Table 8.1 show, that expectation was broadly fulfilled.

For the years 1980-85, announcement period returns to bidders were insignificantly different from zero; ranging from a one per cent loss on an equally-weighted basis to a one per cent gain in value-weighted terms. This contrasts with corresponding returns during 1986-90, which record losses of around 2 per cent for each weighting structure, statistically significant at the one per cent level. Furthermore, in the latter period only 29 per cent of bidders record gains, compared with around 50 per cent in the first period. The contrast between results for the two periods is confirmed with the extended A-C window. During 1980-85 bidder returns were again insignificantly different from zero, but for 1986-90, bidders record both equally- and value-weighted losses approaching 4 per cent, which is significant at the one per cent level.

When the event window is extended backwards, (panel B), the announcement losses for 1986-90 are reduced substantially to less than one per cent, and are not significant. This is due to positive abnormal performance of around 2 per cent in the pre-bid period, (panel A). This result is consistent with certain other UK studies which have explained it in terms of bid anticipation. However, when coupled with the loss recorded in the days around announcement, (panel C), it can also be explained with reference to the hubris hypothesis, (Roll, 1986). According to this model good performance relative to rival firms encourages some management teams to launch misguided acquisitions programmes based on valuation errors.

The post-merger results, (panels E and F), also confirm a substantial difference in returns to bidders in the two sub-samples. According to the market model benchmark, acquirers during 1980-85 suffered statistically significant losses of 9 per cent on an equally-weighted basis, but

⁵ Recall that the average premium paid in 1980-85 was 15.3 per cent, versus 24.8 per cent during 1986-90.

this falls to an insignificant 5 per cent when value-weighted. Furthermore, with the alternative market-adjusted benchmark, post-merger returns are positive for acquisitions consummated during 1980-85. In contrast, post-merger returns to acquirers during 1986-90 are large, negative and statistically significant with both benchmarks and whether equally- or value-weighted. However, the losses are significantly lower on a value-weighted basis, suggesting that the market expects poorer post-merger performances from smaller acquirers.

Turning to the issue of the relatedness of bidder and target, (Table 8.2), the results for 1980-85 are more consistent with modern finance theory, which suggests that diversification is more effectively achieved in financial assets than in productive assets. Related acquirers during this period record small, insignificant losses at announcement, (panel A), with small, but insignificant gains over the longer A-C event window, (panel B). For unrelated acquirers negative *equally-weighted and value-weighted returns are recorded for both event windows*, although only the equally-weighted returns are significant in the A-C window. Even so, for 1980-85, it appears that related acquirers engaging in disciplinary acquisitions, (where synergies and economies are more readily obtained), evoked a better market response than those engaged in unrelated acquisitions.

For 1986-90 the related hypothesis breaks down. Unrelated acquirers fared slightly better than related acquirers, although both groups make statistically significant losses. While inconsistent with the tenets of modern portfolio theory, these findings are consistent with certain recent UK evidence, (Limmack and MacGregor, 1995). There is no single and obvious explanation for these findings, although the advent of the Single Market might well have led to increased tendencies for consolidation within sectors. This, when coupled with the general increase in demand for acquisitions during 1986-90, might well have pushed premiums higher for related acquisitions. This, in turn, would have been likely to have caused a larger negative market response than might otherwise have been the case.

Overall, the results for the two samples are clearly very different. They are consistent with the hypothesis that aggregate M&A activity and changes in the economic climate have a definite impact on the profitability of mergers and acquisitions. The event study evidence is also consistent with the hypothesis that management motivations and acquisition strategies also vary

directly with the economic climate.

2.3 Results of Logistic Regressions with Accounting Data

Since the early 1980s, accounting data has been largely replaced by share price data as a research medium in the mergers and acquisitions literature.⁶ Even so, accounting data has a specific advantage over share price returns, to the extent that it allows a *direct* as opposed to an *indirect* test of the disciplinary hypothesis of the market for corporate control. Given that this hypothesis has formed the explicit basis for UK mergers policy,⁷ a more direct test is clearly preferable. However, it has to be recognised that the use of accounting data can be somewhat problematic, as was discussed at length in Chapter 3.

There is also another reason to use accounting data. It is clearly regarded as important information by corporate management teams and market participants engaged in takeover activity. This is perhaps best exemplified by the literature on the methods and choice of accounting techniques used to consolidate the accounting records of acquired and acquiring firms.⁸

According to the disciplinary hypothesis, bidders should have superior pre-bid performance compared to targets. An obvious test of this hypothesis is to examine the pre-bid accounting data of the two groups: if bidders do exhibit superior performance, then it should be possible to discriminate systematically between bidders and targets. Earlier UK studies using accounting data have employed a variety of statistical techniques to discriminate between pre-bid performances of bidders and targets. On a univariate basis a number of studies have employed serial *t*-tests on a variety of accounting ratios, although it is generally acknowledged that the power of such tests in series is weak. On a multivariate basis, the dominant technique in previous research has been Multivariate Discriminant Analysis (MDA). However, MDA requires that the

⁶ With the notable exception of the large US study by Ravenscraft and Scherer, (1987, 1988)

⁷ Department of Trade and Industry, *Mergers Policy*, (1988).

⁸ For example, the following provide analyses of how acquirers took advantage of changes in accounting rules and legislation during the 1980s: Chatterjee and Meeks (1996), Sudarsanam (1995), Chopping and Skerratt (1994), Higson (1990).

data be drawn from multivariate normal distribution and makes fairly strong assumptions about the covariance structures. Following an initial exploration of the data with univariate tests, MDA was employed, but the discriminant function performed poorly; a result that is broadly consistent with earlier UK studies.

In contrast to previous research, the present study went on to employ logistic regression to discriminate between bidders and targets. This technique is well suited to use with a dichotomous dependent variable, (bidder or target), and does not have the exacting data requirements of MDA. However, as with all regression techniques, it does require independence in the error terms. Unfortunately, one of the acknowledged problems with accounting ratios is that they are highly correlated. To overcome this difficulty, therefore, the accounting data were subjected to a factor analysis procedure, which produced 4 orthogonal independent variables, (return on sales, return on capital, asset utilisation, and financial gearing). To these were added the price-earnings multiple relative to the industry average, (to proxy for growth opportunities), and market value as a measure of firm size. If bidders have superior performance relative to targets, then this should be reflected with positive signs on all independent variables. For obvious reasons the signs on the returns on sales and return on capital factors are of particular interest. It should also be possible to discriminate clearly between the two groups on the basis of the logistic regression results. A value of 25 per cent better than random assignment was utilised as an efficiency criterion for this purpose.

A summary of the results from the logistic regressions used to discriminate between the pre-bid performance of targets and bidders is provided in Table 8.3. The findings for the full 1980-90 sample are compared with those from the two sub-periods, 1980-85 and 1986-90. The relatedness issue is also examined. Finally, the logistic regression results are compared with the event study results summarised in the previous section.

The results for the full sample 1980-90 were poor. While the likelihood ratio (an analogue of the *F*-test in multiple regression) was highly significant, suggesting that the model had some explanatory power, three of the variables had the wrong sign and discrimination between bidders and targets was very weak. The most important discriminators were financial gearing and firm size, a finding consistent with a number of earlier UK studies. On the basis of this evidence, it

is clear that bidders, on average, did not exhibit superior performance in the three years prior to bid announcement.

Table 8.3

Summary of Logistic Regressions to Discriminate between Related and Unrelated Bidders and Targets and Classification Tables.
(Regression Coefficients with R-statistic in brackets) 1980-90 (N=559)
1980-85 (N=190) 1986-90 (N=369).

Predictors	1980-90	1985-90	1986-90
<i>Panel A: logistic regression results</i>			
FROS	-0.0078 (0.0000)	0.2919 ^b (0.0825)	-0.1559 ^c (0.0362)
FROC	0.0971 (0.0102)	0.3232 ^b (0.0784)	-0.0140 (0.0000)
FTAE	-0.1232 ^c (0.0280)	-0.1351 (0.0000)	-0.1311 (0.0180)
FGEAR	0.1607 ^b (0.0430)	0.2501 ^b (0.0680)	0.1449 (0.0236)
RPER	-0.1692 (0.0073)	0.2732 (0.0000)	-0.3647 ^b (0.0642)
MVAL	0.8318 ^a (0.1903)	1.3187 ^a (0.2151)	0.6912 ^a (0.1807)
Constant	-0.3030 ^b	-0.8816 ^a	-0.0685
Sample size	559	190	369
McFadden R ²	0.1028	0.1490	0.1049
Likelihood Ratio	159.5361 ^a	78.5162 ^a	107.2743 ^a
<i>Panel B: percentage of cases correctly identified</i>			
Targets	89.80%	91.58%	87.26%
Bidders	47.14%	54.74%	50.14%
Overall	68.45%	73.16%	68.70%

^{a, b, c} statistically significant at 1%, 5%, 10% levels

There is some correspondence with the event study results for the same period. Assume that superior performance is due to the application of superior management skills, knowledge and

technique:⁹ assume further that superior management teams, on average, are more capable of avoiding loss-making investment projects. Then it follows that if acquirers exhibit superior performance this should mean that their investments in acquisitions should at least achieve a return consistent with the cost of capital. However, (based on the response in the market for corporate control at announcement), the event study results for the 1980-90 sample show clearly that, on average, successful bidders suffer substantial economic loss from this type of investment. To the extent that the accounting data show that bidders do not exhibit superior performance in the pre-bid period, the event study and the accounting results can be considered consistent and mutually reinforcing.

This pattern of consistency between the two sets of results is maintained when the sample is divided into two halves and the logistic regression analysis repeated. For the 1980-85 sample, all the predictor variables, except asset turnover (FTAE) take the correct sign, and of these 4 out of 5 are statistically significant. Furthermore, the total explanatory power of the model increases by almost 50 per cent, with discrimination between bidders and targets considerably improved. On this evidence it would appear that for takeovers consummated during 1980-85 acquiring firms did indeed exhibit superior performance relative to targets. This finding is consistent with the disciplinary hypothesis of the market for corporate control and also with the positive abnormal returns achieved by acquirers in the same period.

In the case of the 1986-90 sample, the reverse is true. In the logistic regression, four of the predictor variables take the wrong sign, with the negative and statistically significant coefficients for the return on sales and standardised price-earnings ratio. McFadden's R^2 is around 10 per cent, which is similar to that for the full 1980-90 sample. The model correctly classifies 69 per cent of cases, which is again similar to the result for the full sample. It is clear that in the 1986-90 sample bidders have poorer pre-bid performance than the target counterparts, a result that is consistent with the negative returns produced by the event study analysis.

The results from the logistic regression analysis of the relatedness issue are contained in Table

⁹ Rather than, for example, mere good fortune or chance.

8.4. On the basis of the accounting data, on average, related acquirers in the full 1980-90 sample were more profitable than the corresponding targets, although the difference is marginal, as reflected in the low levels of explanatory and discriminatory power. The results show that unrelated acquirers were clearly less profitable than their targets. Although related bidders had superior performance relative to targets, this superiority did not extend to a superiority over unrelated bidders, even though latter were outperformed by their targets. The ambiguity of these findings are also reflected in the event study results, which were broadly similar for the two groups.

In the case of the 1980-85 sample, this ambiguity disappears. The group of related acquirers clearly outperformed their targets. All predictor variables in the logistic model take the correct sign, (although only three are statistically significant), and both explanatory power and discriminatory power are the highest achieved for any of the logistic regressions. In the case of unrelated acquirers the results are less convincing. Whilst both explanatory power and discriminatory power are at reasonable levels, firm size is the only significant predictor, and the return on capital and price-earnings predictors take the wrong sign.

The 1980-85 logistic regression results for related and unrelated acquirers are broadly consistent with the findings of the event study analysis. Related acquirers have a mixture of positive and negative returns, depending on the event window, but none is significantly different from zero. The abnormal returns to unrelated acquirers are always negative, (but only the equally-weighted return over the A-C interval is statistically different from zero). Overall, the market for corporate control seems to favour related bidders, but the share price responses for both groups are consistent with the disciplinary hypothesis, which was hypothesised to hold in the 1980-85 period.

For the 1986-90 sample, the logistic regressions show once again that related bidders have marginally better performance than targets, whereas unrelated bidders were clearly outperformed by their respective target group. For related bidders all predictor variables except the price-earnings multiple take the correct sign, and the rate of discrimination is reasonable, although this is due mainly to firm size. In the logistic regression for unrelated acquisitions, the predictors for

return on sales, return on capital and P-E ratio all take the wrong sign, with the last two statistically significant at the 5 per cent level. Whilst these results suggest that the pre-bid performance of related bidders was only marginally better than targets, in the case of unrelated acquisitions the difference between the two groups is much more clear cut, with targets outperforming bidders.

Table 8.4

Summary of Logistic Regressions to Discriminate between Related and Unrelated Bidders and Targets and Classification Tables. (Regression Coefficients with R-statistic in brackets)

Predictors	1980-90		1980-85		1986-90	
	Related	Unrelated	Related	Unrelated	Related	Unrelated
<i>Panel A: logistic regression results</i>						
FROS	0.0938 (0.0000)	-0.0103 (0.0000)	0.6728 ^c (0.0782)	0.2092 (0.0000)	0.1123 (0.0000)	-0.1122 (0.0000)
FROC	0.1943 (0.0496)	-0.0981 (0.0000)	0.3452 (0.0125)	-0.0221 (0.0000)	0.0855 (0.0000)	-0.2085 ^b (0.0533)
FTAE	0.1654 (0.0000)		0.0051 (0.0000)		0.0074 (0.0000)	
FGEAR	-0.0047 (0.0000)	0.2009 ^b (0.0503)	0.2631 (0.0000)	0.2145 (0.0187)	0.1779 (0.0000)	0.2182 ^c (0.0424)
RPER	-0.0703 (0.0000)	-0.2908 (0.0392)	0.5562 ^c (0.0655)	-0.0916 (0.0000)	-0.3931 ^c (0.0449)	-0.3724 ^b (0.0561)
MVAL	1.0759 ^a (0.2057)	0.7133 ^a (0.1762)	1.4692 ^a (0.2118)	1.3021 ^a (0.2160)	0.9640 ^a (0.1979)	0.5546 ^a (0.1605)
Constant	-0.5217 ^b	0.1225	-1.2100 ^a	-0.5207	-0.1743	0.0188
Sample size	235	324	77	113	158	211
McFadden R ²	0.1293	0.0881	0.1910	0.1263	0.1358	0.0904
Likelihood Ratio	83.8581 ^a	79.2175 ^a	41.2603 ^a	39.5661 ^a	59.1342 ^a	52.9133 ^a
<i>Panel B: percentage of cases correctly identified</i>						
Targets	88.46%	87.65%	90.91%	91.15%	88.54%	83.89%
Bidders	51.71%	46.64%	59.74%	52.21%	51.59%	51.18%
Overall	70.09%	67.13%	75.32%	71.68%	70.06%	67.54%

^{a, b, c} statistically significant at 1%, 5%, 10% levels

The consistency found between the event study and accounting results in the 1980-85 period is not replicated for 1986-90. The logistic results for 1986-90 show related acquirers performed

slightly better than targets, whereas unrelated acquirers clearly did not. The event study results show that both groups suffered statistically significant negative abnormal returns, the magnitude of loss larger for the related group.

2.4 Conclusions

The share price results for the full 1980-90 sample suggest that acquisitions are negative net present value projects for acquirers; the accounting results show that acquirers do not exhibit superior performance relative to targets. The finding of negative share price returns to acquirers is consistent with certain UK studies, but inconsistent with others.¹⁰ In fact the inconsistencies to be found among previous studies is a feature of the corpus of empirical work in the UK. In contrast, previous studies using accounting data have produced a rather more consistent set of results. The accounting findings for 1980-90 show that it is very difficult to discriminate between the pre-bid performances of bidders and targets, and this reflects the broad consensus achieved in previous studies. There is, therefore, a certain concordance between the accounting and share price results for 1980-90. However, both sets of results are inconsistent with the disciplinary hypothesis which is the cornerstone of public policy.

When the data was bifurcated into two sub-samples, 1980-85 and 1986-90, the findings were transformed and showed clearly that the date of acquisition has an important impact on the wealth effects of mergers and acquisitions and that the financial characteristics of bidders relative to targets are also time dependent. It was argued in Chapter 6 that changes in the economic climate have a direct influence on the expectations of corporate management teams. In turn, these expectations affect management attitudes to risk, risk preferences and strategies with respect to corporate investment.¹¹ It was argued that during 1980-85 firms were preoccupied with cost cutting as a means of coping with adverse economic conditions,¹² and so 1980-85 was more likely to be associated with 'disciplinary' motives for takeovers. On the other hand, economic

¹⁰ For example, consistent with Limmack (1990, 1991) and Sudarsanam *et al.* (1996), but inconsistent with Franks and Harris (1989).

¹¹ Pike (1986), Grinyer (1986), Kahneman and Tversky (1986).

¹² Geroski and Gregg (1997)

expansion during 1986-90 would have been more consistent with managerial motives based on expansion and market positioning. Therefore mergers during this period were more likely to have been symptomatic of agency problems.

The results for the two sub-samples are broadly consistent with this line of argument. During 1980-85 successful acquirers, on average, produced returns consistent with the cost of capital. Furthermore, those engaged in related acquisitions provided better returns as predicted by the relatedness hypothesis, and clearly found operational synergies and cost savings easier to achieve than those involved in unrelated acquisitions. Support for the relatedness hypothesis was also provided by the accounting data which showed that during 1980-85 bidders, on average, had superior pre-bid performance relative to targets. Both sets of results are consistent with the market for corporate control operating as a mechanism to discipline inefficient and ineffective management teams.

The contrast with the findings for the 1986-90 period is striking. The shareholders of acquiring firms suffered substantial wealth losses. These losses are consistent with the results generated by the accounting data which showed that in the period prior to acquisition bidders, on average, were outperformed by targets. The results for 1986-90 suggest that the market for corporate control was only too well aware of the expansionary, non-disciplinary, non-wealth maximising strategies motives that, on average, appear to have underpinned takeover transactions in this period.

3. IMPLICATIONS FOR MERGER POLICY

The purpose of this section is to examine the implications of the results from the current study for UK mergers policy.

3.1 The Current Policy Stance

As the 1988 *Blue Paper* makes clear, the major concern of mergers policy in the UK continues to be about competition in product markets, (DTI, 1988: para. 1.11). However, in 1984, the dominance of that concern was emphasized via a written reply to a parliamentary question, by

the then Secretary of State, Norman Tebbit. This became known as the 'Tebbit doctrine' and stressed that intervention (i.e. references to the Monopolies and Mergers Commission) had been made and would continue to be made 'primarily on competition grounds'. In judging the competitive situation reference will be made to "... the international context: to the extent of competition in the home market from non-United Kingdom sources and to the competitive position of United Kingdom companies in overseas markets". This emphasis on competition in the formulation and operation of mergers policy continues to the present day.

It is important to note that the rationale for this focus on competition, is not competition for its own sake.¹³ Rather, competition is desirable because the Government believes that it is the best way to achieve,

'... an efficient and flexible economy, which both delivers to consumers the goods and services that they require at the lowest prices, and forms the only lasting basis for secure employment. In short, competition is good for wealth creation', (DTI, 1988: para. 2.8).

As the *Blue Paper* makes clear, competition means freedom to take commercial decisions, including the buying and selling of companies ('productive assets'). While recognising that free markets will not be correct in every case, non-interference in merger activity is seen as a virtue because the Government believes that, '... the people best placed to make a judgement of commercial prospects are those whose money is at stake', (DTI, 1988: para. 2.10). Furthermore, non-interference means that the disciplinary threat from takeover serves to concentrate the minds and efforts of corporate management teams to maximise shareholders' wealth, and that "Any government action which places obstacles in the way of takeovers weakens this discipline", (DTI, 1988: para. 2.11). Intervention will only be invoked when public and private interests diverge, leading to distortion in the market place, reduction in efficiency, and exploitation of consumers via increased market power. In addition, the *Blue Paper* ruled out intervention due to concerns about 'short-termism' in the corporate sector. It also ruled out a reversal of the burden of proof in the regulatory regime, which a number of commentators have suggested, (Pickering, 1983).

¹³ Indeed, a former member of the UK Monopolies and Mergers Commission has suggested that, in terms of maintaining competitiveness in the long-run, "Too much competition, like too much monopoly power, may be harmful to long-run performance", (George, 1989: 291).

While recognising that a small number of mergers can be genuinely anti-competitive, the Government believes that "The vast majority of mergers raise no competition or other objections, ...", (DTI, 1988: para. 2.13).

3.2 Mergers, Competition and Efficiency

The current study did not have policy analysis as its central theme. On the other hand the results generated here can still make a contribution to the policy debate. As discussed in more detail below, current UK mergers policy is predicated crucially on a particular understanding of the term 'competition' and the empirical tests in the present study were not set up to focus directly on the impact of mergers on competition and competitive practices as such. But recall that according to the statement of policy outlined briefly above, competition is merely the medium via which flexibility, efficiency and corporate discipline are developed and enhanced in the UK economy as a whole. On these issues, the findings of the current study most certainly do have something to contribute. That contribution will be developed by posing a set of related questions.

The first of these questions is: what impact do mergers have on competition? Of course, the answer to this depends on the definition of competition. The orthodox or conventional theory would suggest that the impact depends on the type of merger. Conglomerate mergers would have no impact;¹⁴ vertical integration might also have a neutral impact, but this would depend on vertical relationships of the firms involved and the positions of rival firms. In the case of horizontal mergers, the resultant increase in concentration would lead to enhanced opportunities to collude and for abuse of market power: horizontal mergers would therefore, *prima facie*, restrict competition. Despite this, a potential trade-off between increased market power and increased efficiency, formalised by Williamson (1968), could mean that on balance a merger might be considered beneficial to the public interest. Such trade-offs are only considered formally by the MMC following a reference made 'primarily on competition grounds', although the Director General of Fair Trading, who advises the Secretary of State on whether a reference

¹⁴ As Littlechild (1989) documents, there was an earlier concern with aggregate concentration, based on the evidence provided by Prais (1974, 1976), but more recent evidence (Mann and Scholefield, 1986; Hughes and Kumar, 1984), suggests that the growth of aggregate concentration has been reversed.

should be made,¹⁵ no doubt takes into account a wide range of issues when formulating his/her advice.

The case of horizontal mergers is particularly important in the UK context, because historically they have accounted for the majority of mergers undertaken. This reflects the relaxed (and, in orthodox terms, somewhat paradoxical) stance typically taken in the UK with respect to merger policy.¹⁶ Despite the statement that competition is the paramount policy concern, the mergers that most threaten it, in terms of conventional theory at least, dominate M&A activity in the UK.

This apparent paradox is, however, explicable if competition is defined in an alternative, neo-Austrian way. Here competition is conceived of in terms of a *process* rather than a *state* or structural concept. Accordingly, mergers simply represent part of the competitive process and only threaten that process if they establish or increase barriers to entry, (Littlechild, 1989). Even so, according to this theoretical viewpoint, barriers will anyway be broken down in the long-run by the competitive process, particularly via commercial innovations and innovative activities. This theoretical position is supported further by a re-interpretation of the empirical evidence on the positive correlation between concentration and profits, due to Demsetz (1973) and Brozen (1982).¹⁷ This suggests that profits in highly concentrated industries arise as the result of efficiencies due to firm size, rather than to abuse of market power.

The results from the current study do not allow for a definitive conclusion to be drawn about which view of competition is the most accurate. Nevertheless, they do provide evidence about the configuration of bidder and target pre-merger performances, as well as the value consequences of mergers. The findings do, therefore, provide evidence relevant to the policy

¹⁵ The Director General will also discuss and consult on complex cases with the inter-departmental Mergers Panel.

¹⁶ For example, Sir Gordon Borrie, the erstwhile Director General of Fair Trading, describes the UK policy stance thus: "... on a scale ranging from total laissez-faire to total regulation, our [UK] procedures fall very much nearer the first pole than the second", Borrie (1989: 247).

¹⁷ Fairburn and Geroski (1989) provide a useful review of the concentration-profits debate. In the UK the evidence on this link is rather weaker than in the US and, (perhaps as a consequence), the tests on efficiency *versus* market power are also less clear-cut.

debate, and also about the appropriateness of the alternative definitions of competition that often figure in such debate.

To the extent that mergers and acquisitions represent mere transfers of assets and corporate control, they add nothing to the wealth creation process, (Peacock and Bannock, 1991). In order to improve on pre-existing private *and* public welfare distributions, mergers and acquisitions have to produce gains, whether via disciplinary or synergistic efficiencies in production, finance, or marketing. The evidence reported above suggests that such gains are achieved in certain periods, but not in others.

If share price reactions to information about mergers are taken as indicative of market expectations about future efficiency gains, then the value gains experienced by acquirers in 1980-85 suggest that these transactions were likely to have improved private welfare. The slightly higher returns to acquirers involved in related (broadly horizontal) transactions suggest that the value gains to shareholders might have been due to opportunities for increased market power. If so, then at least to some extent, private gains might have been achieved at the expense of social welfare loss.

Given the prevailing economic climate and the level of activity in the market for corporate control, during 1980-85, mergers were characterised as likely to have been undertaken with disciplinary motives to the fore. The results of the accounting data for this period add support to this conjecture. Overall acquirers had slightly better pre-bid performance relative to targets, suggesting that the assets transferred were likely to have passed into the control of superior management teams. The pre-bid superiority of acquirers was more marked in related acquisitions, suggesting that efficiencies would have been even more likely in these cases. This conclusion about the disciplinary nature of takeovers in 1980-85 is reinforced by evidence suggesting that although recession is a demand-side shock, UK firms respond typically on the supply side by focussing management action on cost cutting, (Geroski and Gregg, 1997). Thus, it seems likely that during this period mergers might well have produced operational efficiencies that would have yielded social welfare gains.

On balance, and despite the potential for enhanced market power available in the case of related acquisitions, the accounting and share price results for the period 1980-85 seem to be broadly consistent with the current UK policy stance on mergers. It is also consistent with the definition of competition as a process of rivalrous activity by management teams competing for control over corporate assets. To the extent that, on average, control passed into the hands of management teams with records of superior performance, the market for corporate control during 1980-85 did appear to exert a welfare enhancing discipline. Nevertheless, a caveat does need to be entered at this point. Even though *on average* mergers and acquisitions led to net value gains, at best only 50 per cent of transactions produced positive returns to acquiring firms at the time of bid announcement.¹⁸ If post-merger returns are used, the proportion falls to around 40 per cent. This suggests that the UK market for corporate control viewed half or more of the strategic investments by acquiring firms as likely to result in failure. The possible public interest consequences of such failure are discussed further below.

For the period 1986-90, the results suggest that mergers were unlikely to have delivered clear-cut efficiency gains. Using share price reaction to merger announcements and completions as predictors of the expected consequences of these transactions for the acquiring companies, the evidence is fairly clear-cut. On average, the shareholders of acquiring firms suffered economically substantial and statistically significant losses during this period.¹⁹ This applies equally to related acquisitions, suggesting that even when there might have been opportunities for benefits to accrue via enhanced market power, the market was not convinced that the transfer of control would deliver improved efficiency and profitability. This market judgement is consistent with the evidence from accounting data: overall, bidders did not exhibit superior performances prior to acquisition, although there was some weak evidence in favour of related bidders. Clearly, the evidence from 1986-90 is inconsistent with the view that the market for corporate control is an efficient and effective disciplinary mechanism. These findings suggest that an important assumption of UK mergers policy is invalid. Rather than more efficient

¹⁸ The proportion of positive abnormal returns to related acquirers is greater, reflecting, perhaps, better profit opportunities via enhanced market power.

¹⁹ Once again, the proportion of acquirers with positive returns is well below 50 per cent: for the event window around announcement the proportion is as low as 30 per cent, but this rises to 41 per cent over the A-C interval.

management teams replacing the less efficient, on average, the reverse seems to have been the case during this period. Again the possible public interest consequences are discussed below.

Obviously, there is no necessary correspondence between private sector gains and losses and social welfare effects. As mentioned above, private gains might be achieved at the expense of the public interest, if those gains are brought about by enhanced market power. However, it is doubtful if the reverse is true: that is private losses are not likely to result in social gains, and the opposite is more likely the case. Private losses in the form of negative abnormal returns to acquirers suggest that the market expects post-merger losses in efficiency and effectiveness. Such losses might, at best, be considered to have neutral consequences for the economy as a whole, but poorer resource allocations are more readily associated with social welfare loss. The evidence generated by the current study suggests, on the basis of this reasoning, that in the period 1986-90, merger activity probably had negative consequences for the UK economy as a whole. By the same token, the private gains to merger in the period 1980-85 are at least suggestive of the opposite conclusion.

From a policy perspective, a number of questions arise. Why is the takeover discipline invoked more often in some periods rather than others? Second, assuming that takeovers are indeed symptomatic of a disciplinary response, why is it that in periods when that discipline is invoked more frequently, the outcomes are, on average, negative? Littlechild (1989: 302) - an advocate of unregulated activity in the market for corporate control - encapsulates the conundrums associated with these questions in the following way:

"The reasons for mergers are not fully known: it is difficult to explain the extreme fluctuations in merger activity in terms of either economies of scale or scope or in management inefficiency, ... "

Clearly Littlechild is correct, assuming sufficient demand is available. If scale economies were available in one phase of the mergers cycle, it is difficult to see why they would not be available in another. Despite these arguments, evidence suggests that competitive disadvantage due to scale economies might be less important than was formerly thought, (Prais, 1976; Pratten, 1988). Also, claims from industrialists about the positive association of size and efficiency have been

questioned by prominent members of the UK regulatory authorities, (Borrie, 1989: 252). Furthermore, it has been argued that where scale economies do exist, they are best achieved via organic growth, rather than acquisition, (George, 1989: 286). This last observation is in line with the arguments of Demsetz (1973), who suggests firms grow big because they are efficient. Similar arguments might be mounted about economies of scope, although given the dynamic nature of markets it might be expected that the availability of such economies could vary over time, (but not so regularly as to induce the wave-like pattern of aggregate M&A activity).

Turning to the issue of management inefficiency, there is some evidence to suggest that differentials in corporate performances are magnified in the recessionary phase of the business cycle. This evidence is summarised by Geroski and Gregg (1997:46)

"Performance differentials between firms increase markedly in recessions, mean profitability is pro-cyclical, but variance of profitability rises sharply in cyclical downturns."

If lack of management competence is manifested more clearly in recessionary conditions, then it is to be expected that takeovers would be at their peak during recessions. But this is the reverse of what is typically observed for the UK, and particularly over the period 1980-90. So, as Littlechild observes, it seems unlikely that bouts of 'management inefficiency' are capable of explaining the 'extreme fluctuations' in aggregate M&A activity.

However, management underperformance together with associated disciplinary takeover bids might explain 'normal' or 'equilibrium' levels of aggregate activity. Fluctuations about this equilibrium level might then be accounted for by various non-disciplinary motives, which might jointly be termed 'managerial adventurism', (another form of management inefficiency). Such a view is certainly consistent with an equilibrium-disequilibrium characterisation of aggregate M&A activity proposed by the recent empirical study by Town (1992). It would also be consistent with a number of theoretical contributions, including managerial theories of the firm, (Marris, 1964; Baumol, 1959), the principal-agent problems of free cash flow (Jensen, 1986), and the hubris hypothesis, (Roll, 1986). Finally, this equilibrium-disequilibrium characterisation of mergers would also be consistent with the evidence provided by the current study.

3.3 Policy Implications of this Study

Given such an interpretation of the evidence, what are the implications for mergers policy?

One way of approaching this question is to examine two specific proposals that represent polar extremes of the policy debate that has been conducted in the literature. The first proposal, suggested by Cowling and Sawyer (1989), would institute a complete ban on merger activity, (at least with respect to horizontal merger).²⁰ The second has been advanced by Littlechild (1989), and would involve a further relaxation of the current policy stance. In effect this would amount to almost complete de-regulation of the market for corporate control, albeit in combination with a strengthening of anti-monopoly policy to deal with abuse of market power. These proposals will be analysed in the light of the empirical findings presented above.

3.3.1 Proposals to Restrict Merger Activity

A number of arguments could be advanced for a ban on merger activity, ranging from structural concerns about market power, to concerns about damage to innovative activity. In particular, horizontal mergers present obvious difficulties in terms of increases in concentration and enhanced opportunities to abuse market power. They reduce the number of firms operating in a given product market and tend to create dominant market positions.²¹ The increases in concentration, according the traditional view, lead to restrictions in output and to manifestations of supernormal profit.

The empirical literature suggests that the concentration-profitability link has been fairly weak in the UK and has become even weaker since the 1970s. Nevertheless, recent research, focussing on market shares of individual firms rather than concentration measures, does suggest that large shares are linked to the persistence of above-average profit rates, (Cubbin and Geroski, 1987). This claim that above-average profitability results from 'market dominance' rather than merely

²⁰ Although written jointly, in fact the two authors disagree about the extent of such a ban. Cowling would be unyielding in its operation, whereas Sawyer would be inclined, in exceptional circumstances, to be more pragmatic, allowing mergers to be consummated where the firms involved could demonstrate clearly that the proposed merger would operate in the public interest.

²¹ Of course, the merger of two or more smaller firms might provide off-setting advantages, if increased size allows the new combination to compete on a more equal footing with existing dominant firms.

'concentrated oligopoly' also receives support from Utton (1986). While allowing that profit rates do not appear to be as high as those in the US and the rest of the EU, the stronger tendency for above-average profit rates to *persist* in the UK leads Fairburn and Geroski (1989) to interpret these findings as evidence for a 'sluggish competitive process' in UK product markets. Although these recent contributions to the literature do suggest that more than simple industry characteristics are required to explain this persistence phenomenon, its existence does at least suggest that there might be some merit in strengthening merger policy.

However, the theoretical contribution of Demsetz (1973), does suggest an alternative interpretation of the persistence and concentration-profits evidence. This would be to suggest that the above-average profits of larger firms are simply due to efficiency. Here too, though, the UK evidence for this efficiency effect of large size is not strong, (Clark, Davies and Waterson, 1984).

While none of these arguments is necessarily conclusive, it is clear that horizontal mergers always reduce competitive pressures on acquiring firms, to the extent that they reduce the sources of rivalrous activity and the number of independent decision making centres, (Peacock and Bannock, 1991). For these reasons, it might be argued, the public interest might be better served by internal growth, to the extent that it preserves the number of domestic rivals in a given market and intensifies the pressures to innovate. For example, Porter (1988) has argued that the international success of Japanese firms has been due in no small measure to strong domestic competition, which has fostered the now legendary regimes of dynamic improvement of Japanese firms. He argues that while mergers might deliver 'static' efficiency gains in the short run, these can be overturned in the longer term, due to reduced rivalry and the concomitant relaxation in competitive pressures and incentives for dynamic improvement. Although these arguments have been couched in terms of horizontal mergers, if independent centres of decision making are important for the competitive process, then clearly they might also apply (albeit perhaps to a lesser extent) in the case of vertical and conglomerate mergers.

A counter-argument to this might be advanced on the basis of the openness of the UK economy (unlike Japan) and the extent to which UK firms are subject to competition from foreign rivals. Certainly the Tebbitt guidelines make explicit reference to this source of competition. However,

as Borrie (1989: 251) points out:

'... it is simply not the case that all UK markets are now just part of a larger geographical market. In some cases, we are dealing with goods and services that are not traded ... even where manufactured goods are concerned, there can be non-tariff barriers to trade ...'

On the other side of that coin, arguments have also been advanced by UK industrialists and their representative organisation, the CBI,²² that even if some mergers give rise to concern about competition in the domestic market, they might be necessary for the creation of UK firms that are large enough to compete effectively with foreign rivals. Again, the competitive situation of UK firms in overseas markets is referred to explicitly in the Tebbitt guidelines.

The findings from the present study offer only limited evidence about these issues. Nevertheless, the results for the period 1986-90 show clearly that, on average, the market for corporate control was sceptical about the benefits of increased size, regardless of whether it involved an acquisition in a related line of business or not. In addition, the accounting data show equally clearly that, on average, acquirers had poorer pre-merger performance than targets. When combined with evidence from the management literature about the difficulties often encountered with the integration of newly acquired assets, the results indicate that post-merger efficiency gains were likely to have been difficult to achieve. Of course in the period 1980-85, (when M&A activity might be characterised as being at an equilibrium level), the reverse seems to have been the case.

3.3.2 Proposals to Relax Merger Policy

Turning to the proposal to relax UK merger policy, the arguments here tend to be couched in terms of current policy as an inhibitor of the competitive process, (Littlechild, 1989). Much of the argument turns on the revisionary hypothesis of Demsetz (1973), which posits that the positive association between concentration and profits is due to the competitive advantages of size and productive efficiency. Thus high profits are due to these efficiency effects and not abuse of market power. Equally important is the definition of competition as a 'process' rather than as a structural concept. A definition that has a clear resonance with existing UK policy as set down

²² Referred to in Borrie (1989).

in the 1988 *Blue Paper*. Given this definition, Littlechild takes the existing policy stance that '... intervention should be kept to a minimum ...' one stage further to suggest that only mergers that give rise to the establishment or raising of barriers to entry should be referred.²³ Unlike the contribution from Borrie (1989) quoted above, Littlechild suggests that '[I]nternational competition in the home market is a particularly important type of entry.'

The virtually free rein to M&A activity proposed is also based on the disciplinary threat posed by the takeover market, Littlechild (1989: 308):

'... the present market for corporate control provides more adequate protection for shareholders than any other known device. The threat of takeover acts as a spur to efficiency. Any reduction in this threat would affect not only those mergers actually proposed, but potentially *all* companies whether envisaging merger or not.'

The takeover discipline is obviously seen as a crucial and indispensable part of the competitive process. To substantiate the disciplinary threat, Littlechild tends to dismiss the evidence on the adverse post-merger changes in accounting profits, but cites approvingly the findings of a number (though by no means all) UK event studies, as well as research from the US.²⁴ Even though he finds the event study research convincing, Littlechild (1989: 310) does acknowledge that '[T]he proper interpretation of the share price changes is nonetheless not entirely clear'. In particular, the fact that target shareholders retain the 'lion's share' of any gains he regards as a puzzle in a (perfectly?) competitive takeover market. Second, he does concede that simply because bidders are willing to pay a premium for control does not necessarily imply inefficiency on the part of the incumbent management team of the target. Nevertheless, Littlechild is sufficiently convinced by the share price research to advocate a substantial relaxation in UK merger policy.

²³ Littlechild (1989: 311-21) employs a much narrower definition of barriers to entry than would be found in the more orthodox industrial economics literature.

²⁴ These studies show that targets gain and bidders do not lose, which Littlechild takes to be evidence of the efficiency of the market for corporate control. He also refers to event study evidence from Jensen and Ruback (1983) that gains are not arise due to increases in monopoly power, (presumably relying on the studies of Eckbo, 1983 and Stillman, 1983 reviewed by Jensen and Ruback).

The results of the present study both support and contradict Littlechild's premise about the takeover market as a selective and efficient discipline over corporate management teams. The findings for the 1986-90 period suggest that any proposal for a further relaxation in mergers policy would be inappropriate, to the extent that such a proposal is predicated on the efficiency and efficacy of the takeover discipline. The evidence for 1986-90 suggests clearly that, on average, less efficient management teams with access to larger financial resources acquired more efficient, but smaller targets. This inference about the inadequacy of takeovers as a disciplinary mechanism is consistent with the conclusions of Franks and Mayer (1996: 180), drawn from their study of hostile UK takeovers:

'The market for corporate control does not therefore function as a disciplinary device for poorly performing companies.'

In contrast, the results for 1980-85 period suggest that this is too sweeping a judgement. For this period at least, the disciplinary device seems to work reasonably well. On average, acquirers were more efficient than targets, and the positive share price responses suggest that the market expected future performance improvements. Thus, the proposal to allow corporate management teams the freedom to buy and sell productive assets with less hindrance is at least consistent with the private returns in this period. In addition to successful bids, there is evidence that even when a bid is unsuccessful it can have a positive impact on the subsequent performance of the target firm, (Pickering, 1983; Holl and Pickering, 1988).

On balance, however, the results for the full sample period, 1980-90, suggest that, on average, the market mechanism is not very effective in its selection of takeover targets. No doubt the typical neo-Austrian focus on the long term would suggest that errors in takeover selection would be corrected, but to the extent that such corrections take time, the mis-allocation of resources could have detrimental impacts on the competitiveness of the the firms involved as well as for the UK economy as a whole. For example, if merger activity were to inhibit innovation, (an important feature of neo-Austrian arguments about competition and competitiveness), then competition would be damaged. The current study has not examined this issue, but there is evidence to suggest that mergers can indeed damage innovation and innovative activity.

Hitt *et al.* (1991) provide evidence that mergers and acquisitions have a 'direct negative effect on a firm's R&D activity', and that firms which pursue a 'portfolio strategy' (via conglomerate merger, for example) are the least innovative. Hoskisson *et al.* (1994) find that growth by merger is often a substitute for innovative activity, even though the latter is closely linked to competitive advantage and is important both for individual firms and for the wider economy. The study of mergers in the UK pharmaceutical industry by Jones (1996), using Porter's theory of competitive advantage, adds weight to these arguments. Finally, Hitt *et al.* (1996) find evidence that emphasis on increased financial controls post-merger can have adverse consequences by shifting managerial focus away from innovative activity. This conclusion has a particular resonance with the results for 1986-90. If the adverse impact on the share price of acquirers does force them to focus too heavily on financial controls to the detriment of innovation, then the 1986-90 findings suggest that such problems might be widespread.

Given that targets are typically much smaller than the firms that acquire them, that smaller firms are more innovative, (Freeman, 1982), and that smaller firms are playing a growing role in innovative activity, (Geroski, 1987), the loss of independence by smaller firms via merger could be seen to be against the public interest.

Furthermore, if the threat of a takeover causes potential targets to divert resources away from investment and innovation, in order to maintain short term profits, then this too points to the potential for a misallocation of resources due to the takeover threat. Research into the so-called 'short-termism problem' in the UK is inconclusive, but recent survey evidence does suggest that,

'... a large proportion of finance managers of UK quoted companies was likely to behave in a way that constrained commitments to revenue investments by reference to considerations of short-term accounting profit. Furthermore, the behaviour of such managers seems likely to have been a function of their beliefs about capital-market behaviour.' Grinyer *et al.* (1998: 21).

3.3.3 Summary

The empirical results generated by the present study demonstrate that there are clear problems with these two policy extremes. The 1986-90 results broadly support arguments about the

deleterious impact that mergers can have on the competitiveness of the UK economy. On the other hand, those for 1980-85 are consistent with the disciplinary hypothesis and with the view that mergers can generate benefits for the firms involved and for the economy as a whole.

Less far-reaching and extreme policy prescriptions have also been advanced that take account of this balance of costs and benefits. For example, as a result of their inquiry into the impact of M&A activity, Peacock and Bannock (1991: 101) recommend that 'major biases in favour of takeovers in public policy should be investigated and, as far as practicable, removed.' Likewise, in his detailed examination of the anti-regulation approach of Littlechild, George (1989) concluded that policy aimed at preventing the creation of dominant positions is likely to be more effective and practicable, than policy aimed at detecting and then dealing with anti-competitive behaviour by dominant firms. At the same time George did not advocate any radical change to the present policy regime.

Probably the last occasion that a major shift was contemplated in UK policy was in the Green Paper, 1978. The Paper argued that a more sceptical view should be taken of mergers, and that '... the policy should be shifted to a neutral approach'. One way of operationalising that shift might be to place the burden of proof on the parties to a merger rather than the Commission, and this has been suggested by a number of commentators. Of course, reversing the burden of proof would only affect those mergers referred for investigation. In any case, the policy stance has not been shifted.

The mixed set of results obtained during the current study suggests that it is probably correct to eschew major reform of merger policy in the UK. However, substantial and statistically significant losses to acquirers during 1986-90, coupled with the evidence from accounting data that those acquirers were, on average, less profitable than the firms that they acquired, does suggest that there is the potential for improvement in the policy regime. The final section outlines a modest proposal for such an improvement within the existing policy framework. This proposal differs from others that have been advanced in the literature, (for discussions of these see Borrie, 1989; George, 1989; Peacock and Bannock, 1991), in that it focusses on trying to improve the way in which the market for corporate control currently functions.

4. IMPROVING THE EFFICIENCY OF THE UK TAKEOVER MARKET

In this section an attempt is made to investigate how the results from this study could be utilised to change and improve merger policy directly. Attention is directed towards the second, non-statutory strand of UK merger policy, which deals with the protection of shareholders of firms involved in mergers and acquisitions, the *City Code on Takeovers and Mergers*.

The Code represents the set of rules by which the *City Panel on Takeovers and Mergers* regulates the conduct of takeover bids. This self-regulatory arrangement was promoted by the Bank of England in 1968, in response to growing concerns about the way in which the market for corporate control was subject to manipulation by the management teams of bidders, targets and their advisers. Currently, the Code consists of 10 General Principles and 38 Rules, supplemented by Notes to clarify the Rules. In essence, the Code is designed to ensure a fair market in the securities of bidders and targets and the equal of treatment of shareholders. An important feature of the Code and the Panel's protection of shareholders concerns the appropriate and timely release of information. While the shareholders of bidders and targets are covered by the provisions of the Code, the major focus concerns the treatment of target shareholders. As various rulings of the Panel have demonstrated, the need to protect target shareholders is evident. However, the empirical results of the present study show clearly that there is also a clear need to protect the interests of bidder shareholders on many occasions.

By and large, target shareholders obtain the 'lion's share' of any value gains that arise from a merger or an acquisition. Equitable considerations mean that there is a need to ensure all target shareholders benefit equi-proportionately from such gains, but the empirical results (particularly those for 1986-90) suggest that shareholders of bidding firms might be in rather more need of enhanced protection. It will be argued that improved protection can be obtained at very little cost by requiring increased information disclosure. Such requirements will also have a dual function, to the extent that improved information disclosure improves the decision making of corporate management teams involved in mergers and acquisitions.

The empirical results above suggest that economically dubious decisions are often made by the

managements of many bidders and their advisers, particularly, (following the arguments outlined earlier), in periods when the market for corporate control is in a state of disequilibrium. Although directors of bidders, have a duty under the provisions of the Code and the Companies Acts to act in the interests of shareholders,²⁵ the results from the period 1986-90 suggest that these duties do not weigh heavily in many mergers and acquisitions. Comparing the consequences of abandoned bids with the many completed mergers that have produced unsuccessful outcomes, Pickering (1983:279) suggests that the managers of potential acquirers '... would be well advised to adopt a greater sense of realism about the likely outcomes of any merger that they have in mind ...'.

To afford added protection to the shareholders of bidders, and to improve incentives for directors to act in shareholder interests, a simple proposal is that directors should be required to disclose more information about the rationale for merger and acquisition proposals. Specifically, the directors of bidders should be required to explain in some detail why they are seeking to gain control of the target, and the specific pecuniary benefits they expect to flow from the acquisition. In addition, those directors should be under a duty to report on the subsequent outcome of an acquisition. The arguments in favour of these disclosure requirements are set out below.

To begin the argument, it will be useful to recall the rationale for the largely non-interventionist stance that was outlined in the 1988 *Blue Paper*. An important part of that rationale is set out in paragraphs 2.9 and 2.10.

Paragraph 2.9: '... Government should not normally intervene in the market's decisions about the use to which assets should be put, since private decision-makers will usually seek (and usually be best placed to achieve) the most profitable employment for their assets, and in competitive markets this will generally lead to the most efficient use of those assets, for the benefit of both their owners and the economy as a whole.'

Paragraph 2.10: 'It does not follow that the market's decisions are correct in every case. Mistakes can be made in the private as much as in the public sector. The bulk of the evidence ... is that the commercial performance of enterprises post-merger has, more often than not, failed to live up to the claims of the acquiring firm at the time of the merger.'

²⁵ The interests of employees and creditors are also included in the Code, although the interests of shareholders are paramount.

However, it is for investors to assess this evidence and to act on it as they see fit. For its part the Government believe that the people best placed to make a judgement of commercial prospects are those whose money is at stake; ...'

An important point to make, in passing, is that, by and large, it is not '... those whose money is at stake' who make decisions about takeover bids in the first place. It is fund managers of financial institutions who make these decisions, and these agents might well have vested interests in taking a passive approach to the merger plans of corporate management teams, (Peacock and Bannock, 1991).

Despite the belief on the part of Government that investors are best placed to judge commercial prospects, the *Blue Paper* does recognise the importance that appropriate information plays in the making of such judgements.

Paragraph 2.29: 'Under the Government's policy of leaving most merger decisions to the market, it is important that adequate information should be *publicly* [emphasis added] available as a basis for the market's assessments and decisions.'

This paragraph was followed by another which dealt with the accounting treatment of mergers and acquisitions,²⁶ but the sentiments behind it could equally apply to the provision of information that forms the basis of merger decisions. This is an observation that has already been made in the academic literature, (Mueller, 1989).

To be in a position to make assessments of managerial performance and the commercial prospects of a merger, both market analysts and shareholders of acquiring firms need two types of information, which typically they do not possess. First, a detailed forecast of the benefits that the management of the bidding firm expect to be generated from an acquisition; and second, a post-acquisition audit detailing the subsequent performance. Disclosure of such information would allow an appropriate assessment of a management team's ability to select a victim, drive the right bargain, and subsequently manage the acquisition. A simple principal-agent argument would suggest that in the absence of a legal or quasi-legal requirement to publish such

²⁶ Subsequently amended radically under the auspices of the Accounting Standards Board.

information, management teams are unlikely to do so. Enforced disclosure might also have the desirable benefits of forcing management teams to exercise a greater degree of caution when undertaking expansion via merger. In addition, disclosure of a performance benchmark would tend to concentrate their efforts and improve incentives to generate maximum benefit from the productive assets acquired.

Disclosure of anticipated gains from a merger could be thought to be akin to the prospectus that promoters of a business must issue to prospective investors. Given that many mergers involve substantial combinations, consolidations, and re-configurations of assets and lines of business, an argument could certainly be made for the need to issue a proper prospectus. In that sense, it seems not unreasonable that those who propose such transformations to the original business should be required to justify their plans with a public declaration.

A possible objection to this new form of disclosure might be a claim that existing internal corporate control procedures are sufficient for these purposes. However, the empirical evidence on executive remuneration²⁷ suggests that corporate management teams might have powerful and self-interested incentives to expand via merger and acquisition.²⁸ In the face of such incentives, the UK evidence about the effectiveness of internal control mechanisms, suggests that they are weak and largely ineffective. For example, the presence of non-executive directors on the boards of public companies could be seen as a potentially important constraint on the self-interested actions of executives. But it must be recognised that the appointment of non-executives is effectively under the control of executive members of a board, and the non-executives are often executives of other companies in their own right. Furthermore, institutional shareholders seem reluctant to play an active role in monitoring, even where (rarely) they place representatives on corporate boards, (for an examination of these issues see, for example, Cosh and Hughes, 1987; Keasey *et al.*, 1997).

²⁷ See Chapter 2, section 6 for a summary of this literature.

²⁸ A related and interesting line of enquiry, and one not replicated with more recent data, is the study by Firth (1980), which showed that the larger the managerial equity stake, the lower is the probability that managers will initiate a takeover bid.

Another objection to the forced disclosure of information about the perceived or estimated benefits of an acquisition might be the competitive advantage that such disclosure gives to potential rivals of the bidder. In addition, disclosure might reduce the incentives that potential bidders have to gather information about potential targets which, it has been argued, would weaken the disciplinary function of the market for corporate control, (Littlechild, 1989). However, results for the 1986-90 period, when on average targets performed as well if not better than acquirers, suggest that the market mechanism, in the form of acquisitive management teams, often results in poor target selection, and that too many mergers appear to be undertaken for reasons other than the benefit of shareholders. Second, given that firms operate in a public market place and publish financial data at regular intervals, it seems unlikely that disclosure would force select and uniquely informed bidders to reveal information that could not be obtained by potential rivals.

The second element of the disclosure proposal would require acquirers to report on the performance of their acquisitions.²⁹ That a post-merger audit is an essential prerequisite for good management is well understood within the accounting profession in the UK:

'A post audit has great merit, given that the aim is to improve performance, gain more from the acquisition, and learn how to do better next time, rather than to apportion blame and identify scapegoats, i.e. given that it is a completely honest and open performance.'
Williams (1980: 32)

The last part of this quotation refers no doubt to relationships within the acquiring firm: the shareholders might not see things in quite the same light. That scapegoating and the attribution of blame can be dysfunctional in an organisational setting is undoubtedly true, and such behaviour could result in incentives to conceal shortcomings in strategic decision making. As a result, it might be argued, the requirement to publish information about post-merger performance could have perverse effects for shareholders. However, the willingness or otherwise of the acquiring management team to co-operate in the audit process would be of little consequence.

²⁹ The period over which post-merger disclosure should occur could safely be left to the acquirers to decide. There seems no obvious why directors should not be left to decide the specific number of post-merger reports are required to inform shareholders about the full extent of integration costs and benefits that they expect to flow a specific acquisition.

Incentives to show a merger in a better light than is truly the case, would only result in showing performance generated from the original set of assets in a poorer light. Managers would have no obvious incentive to swell the performance of the merger at the expense of the pre-merger set of assets. For as Williams (1980: 31) points out: 'The simple test of a good acquisition is that eventually $2 + 2 = 5$ '.

It might also be argued that the requirement for post-merger disclosure would produce additional and unnecessary burdens and costs for the acquiring firm. But, as Mueller (1989) points out, the evaluation of an acquisition should be part of any good management practice. In other words, good managers should be carrying out the post-acquisition audit in any case. Thus the additional costs of publication and scrutiny by the firm's auditors are likely to be small.

The audit would also generate a useful by-product for shareholders. The professional accountancy firm which is contracted as auditor to the acquiring firm, is often retained as an adviser (along with other professional firms such as lawyers, merchant banks, etc.) when a take-over bid is being put together. The post-acquisition audit might also be a good guide as to the value for money obtained from such advice. The fees of acquisition advisers can be considerable, and it is surely not unreasonable that shareholders have information about the performance of professional advisers retained, (or the ability of the incumbent management to choose professional advice), as well as the performance of the firm's management team.

The proposal for pre- and post-merger disclosure is a modest reform, but one that might have potentially useful consequences, for the economy as a whole as well as for private investors. If markets operate on the basis of information, and they surely do, then increasing useful information to market participants, ought, *ceteris paribus*, to improve the operation of any market, including the market for corporate control. The requirement for managers of bidders to reveal their forecast of profit improvements prior to acquisition has the considerable merit of redressing the balance of power in the corporate sector. It is also likely to ameliorate, to some extent, the potential disbenefits due to the asymmetry of information that exists between shareholders and managers.

In addition to the private sector benefits that would accrue with the introduction of increased disclosure, it is also likely to lead to beneficial spin-offs for the UK economy. To the extent that increased disclosure might act as a deterrent to engage in potentially dysfunctional mergers the efficiency of UK firms would be enhanced. It might be objected that private sector firms should be allowed to make mistakes, because the consequences of those mistakes are experienced only in the private sector. And further, that those mistakes will be rectified subsequently *inter alia* by the operation of the market for corporate control, (Littlechild, 1989). However, to the extent that those mistakes reduce productive efficiency and the competitiveness of UK firms, (for example, by reducing innovative and rivalrous activities), and take time to be unwound, they represent a loss to the economy as a whole.

The disclosure proposal also has the merit of not requiring any shift in the current policy stance towards mergers and acquisitions. If increased disclosures of the type proposed were to lead to a more efficient market for corporate control, it might even mean that the regulatory authorities could adopt an even more relaxed stance to mergers.

5. CONCLUDING REMARKS

The empirical results generated by both share price and accounting data suggest that any proposal for dramatic changes to the current UK policy stance on mergers is probably unwarranted. For the full 1980-90 sample the results suggest that, on average, mergers and acquisitions were negative net present value projects for the firms that undertook them. Furthermore, the accounting data demonstrated that strong performers did not take over the weak. To the extent that private gains and losses reflect consequences for competition and the public interest, mergers and acquisitions during 1980-90 seem likely to have had, at best, a neutral impact on the competitiveness of the UK economy.

However, when the impact of macroeconomic conditions and level of aggregate merger activity were taken into account, the results describe a rather different picture. In the first half of the sample, 1980-85, the share price and accounting data were consistent with the characterisation of the market for corporate control as a selective device for the discipline of ineffective corporate

management. The shareholders of acquirers did not suffer wealth depletions and acquiring firms, on average, exhibited superior financial performance relative to targets and industry norms. In contrast, the 1986-90 results were more consistent with managerialist theories of the firm. Shareholders of acquirers suffered economically substantial and statistically significant wealth losses and the accounting data showed that targets were not underperformers, relative either to acquirers or the industry average. These results suggest that, depending on the phase of the business and mergers cycles, activity in the market for corporate control can be symptomatic of principal-agent problems, as well as a means to correct them.

If, as suggested above, the two periods can be represented as equilibrium and disequilibrium phases of the merger cycle, the question arises as to whether intervention via the operation of merger policy is able to influence tendencies that lead to disequilibrium? The evidence suggests that any radical overhaul of mergers policy might do more harm than good. However, it was argued that a modest proposal to increase disclosure of relevant information to shareholders and the market for corporate control could lead to improvements in the efficiency and effectiveness of that market. It would do this by improving the incentives for management teams intent on expansion via merger and acquisition to take more account of shareholder interests. By requiring potential acquirers to make public their estimates of the costs and benefits associated with an acquisition the quality of decision making would be improved. This would benefit shareholders and also the public interest to the extent that target selection would be improved.

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